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# **Brigham Young University Bulletin**

## **Graduate School Catalog**

1975-76

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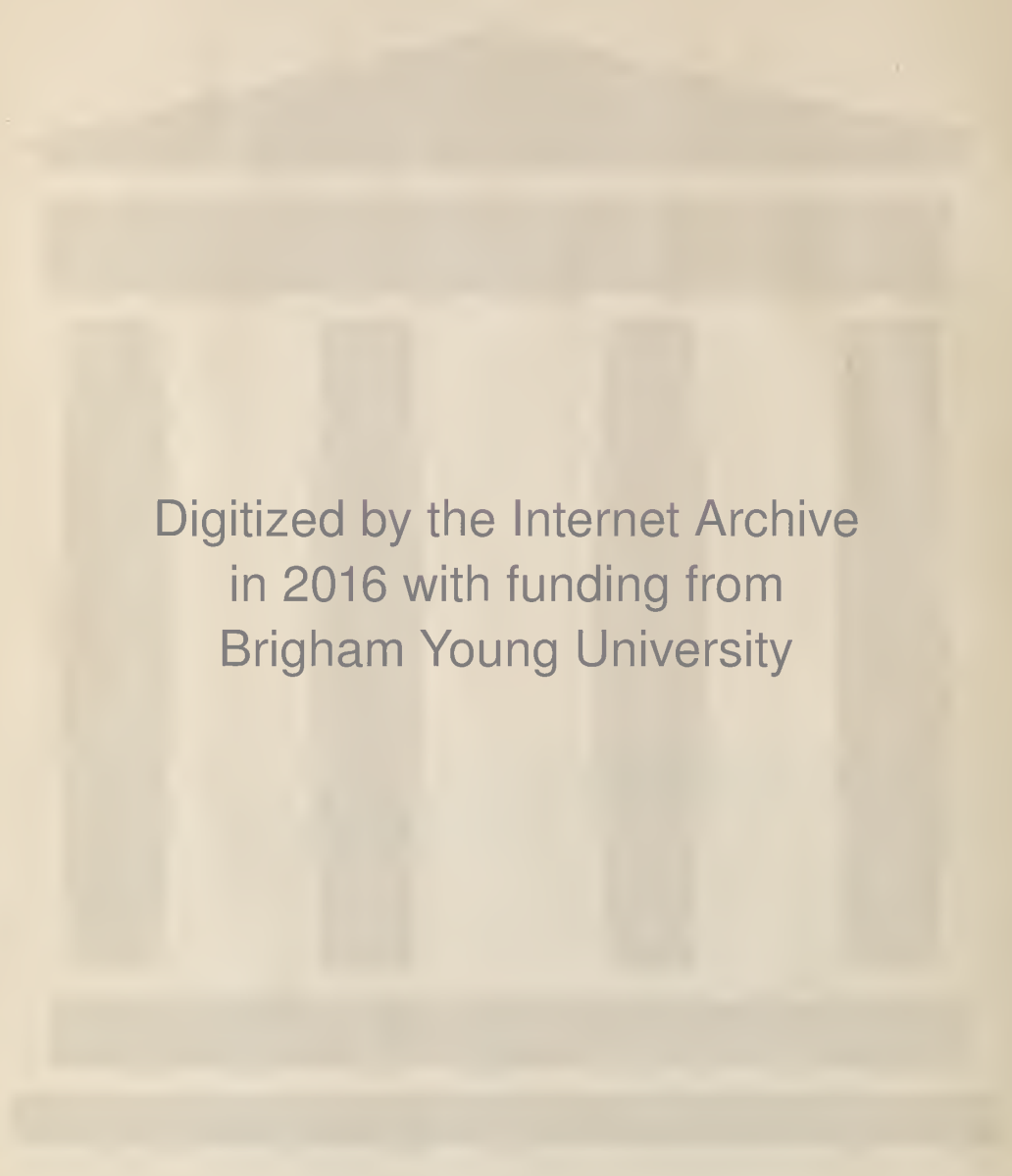
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Lewis Building (destroyed by fire in 1884) at 300 West Center Street, first home of Brigham Young Academy.



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# University Calendar

## Fall Semester, 1975

- May 7** Final date for international graduate students to submit applications for Fall Semester, 1975
- June 30** All internship and supplementary award nominations due
- July 7** Last day to submit advance registration forms for Fall Semester, 1975
- July 7** Final date for degree-seeking graduate students to submit applications for Fall Semester, 1975
- August 7** Final date for nondegree graduate students to submit applications for Fall Semester, 1975
- August 22** Tuition mail-in deadline for Fall Semester, 1975
- August 27-28** Preschool faculty workshop
- August 29** Registration for all students who did not use advance registration system
- September 1** Labor Day holiday
- September 2** Class instruction begins
- September 2** First day change in registration permitted
- September 2** First day late registration fee assessed
- September 15** Last day for late registration and adding classes
- September 16** Fee in effect for dropping classes
- October 6** Last day to officially withdraw from the University without failing grades
- November 27-28** Thanksgiving holiday
- December 1** Last day to officially withdraw or drop classes for any reason
- December 16** Last day of class instruction
- December 17-19** Final exams

## Winter Semester, 1976

- September 8** Final date for international graduate students to submit applications for Winter Semester, 1976
- November 7** Last day to submit advance registration forms for Winter Semester, 1976
- November 8** Final date for degree-seeking graduate students to submit applications for Winter Semester, 1976
- December 8** Final date for nondegree graduate students to submit applications for Winter Semester, 1976
- December 23** Tuition mail-in deadline for Winter Semester, 1976
- January 2** Registration for all students who did not use advance registration system
- January 5** Class instruction begins
- January 5** First day change in registration permitted
- January 5** First day late registration fee assessed
- January 16** Last day for late registration and adding classes
- January 19** Fee in effect for dropping classes
- February 9** Last day to officially withdraw from the University without failing grades
- February 27** Spring break (vacation)
- March 5** Last day for graduating student in MBA, MPA, or Organizational Behavior to submit Forms No. 6a and No. 6b
- March 12** Last day for graduating student in a thesis program to submit three copies of thesis in final form and Forms No. 6a and No. 6b to department chairman
- March 19** Last day for graduating student in a non-thesis program to submit Forms No. 6a and No. 6b to department chairman
- March 26** Last day for graduating student to submit final copies of thesis, project, or dissertation to office of the Graduate Dean
- April 2** Last day for graduating student to submit Form No. 10 (or Form No. 5b for written exams) to Office of the Graduate Dean  
(All requirements must be completed. Diplomas will not be mailed until after grades for the previous semester or term are in.)

- April 2** Last day to officially withdraw or drop classes for any reason
- April 19** Last day of class instruction
- April 20-22** Final exams
- April 23** Commencement exercises and college convocations

## Spring Term, 1976

- January 15** Final date for international graduate students to submit applications for Spring Term, 1976
- March 15** Final date for degree-seeking graduate students to submit applications for Spring Term, 1976
- March 15** Last day to submit advance registration forms for Spring Term, 1976
- April 15** Final date for nondegree graduate students to submit applications for Spring Term, 1976
- April 20** Tuition mail-in deadline for Spring Term, 1976
- April 26** Registration for all students who did not use advance registration system
- April 27** Class instruction begins
- April 27** First day change in registration permitted
- April 27** First day late registration fee assessed
- May 4** Last day for late registration and adding classes
- May 5** Fee in effect for dropping classes
- May 11** Last day to officially withdraw from the University without failing grades
- May 31** Memorial Day holiday
- June 4** Last day to officially withdraw or drop classes for any reason
- June 18** Last day of class instruction

## Summer Term, 1976

- March 7** Final date for international graduate students to submit applications for Summer Term, 1976
- May 7** Last day to submit advance registration forms for Summer Term, 1976
- May 7** Final date for degree-seeking graduate students to submit applications for Summer Term, 1976
- June 7** Final date for nondegree graduate students to submit applications for Summer Term, 1976
- June 11** Tuition mail-in deadline for Summer Term, 1976
- June 19** Registration for all students who did not use advance registration system
- June 21** Class instruction begins
- June 21** First day change in registration permitted
- June 21** First day late registration fee assessed
- June 28** Last day for late registration and adding classes
- June 29** Fee in effect for dropping classes
- July 2** Last day for graduating student in MBA, MPA, or Organizational Behavior to submit Forms No. 6a and No. 6b
- July 5** National holiday
- July 6** Last day to officially withdraw from the University without failing grades
- July 9** Last day for graduating student in a thesis program to submit three copies of thesis in final form and Forms No. 6a and No. 6b to department chairman
- July 16** Last day for graduating student in a nonthesis program to submit Forms No. 6a and No. 6b to department chairman
- July 23** Last day for graduating student to submit final copies of thesis, project, or dissertation to Office of the Graduate Dean
- July 24** State holiday
- July 30** Last day to officially withdraw or drop classes for any reason
- July 30** Last day for graduating student to submit Form No. 10 (or Form No. 5b for written exams) to Office of the Graduate Dean  
(All requirements must be completed. Diplomas will not be mailed until after grades for the previous semester or term are in.)

- August 12** Last day of class instruction  
**August 13** Commencement exercises and college convocations

### Fall Semester, 1976

- May 7** Final date for international graduate students to submit applications for Fall Semester, 1976  
**June 30** All internship and supplementary award nominations due  
**July 6** Last day to submit advance registration forms for Fall Semester, 1976  
**July 7** Final date for degree-seeking graduate students to submit applications for Fall Semester, 1976  
**August 7** Final date for nondegree graduate students to submit applications for Fall Semester, 1976  
**August 20** Tuition mail-in deadline for Fall Semester, 1976  
**August 25-26** Preschool faculty workshop  
**August 27** Registration for all students who did not use advance registration system  
**August 30** Class instruction begins  
**August 30** First day change in registration permitted  
**August 30** First day late registration fee assessed  
**September 6** Labor Day holiday  
**September 13** Last day for late registration and adding classes  
**September 14** Fee in effect for dropping classes  
**October 4** Last day to officially withdraw from the University without failing grades  
**November 25-26** Thanksgiving holiday  
**November 29** Last day to officially withdraw or drop classes for any reason  
**December 14** Last day of class instruction  
**December 15-17** Final exams

### Winter Semester, 1977

- September 8** Final date for international graduate students to submit applications for Winter Semester, 1977  
**November 5** Last day to submit advance registration forms for Winter Semester, 1977  
**November 8** Final date for degree-seeking graduate students to submit applications for Winter Semester, 1977  
**December 8** Final date for nondegree graduate students to submit applications for Winter Semester, 1977  
**December 24** Tuition mail-in deadline for Winter Semester, 1977  
**January 3** Registration for all students who did not use advance registration system  
**January 4** Class instruction begins  
**January 4** First day change in registration permitted  
**January 4** First day late registration fee assessed  
**January 14** Last day for late registration and adding classes  
**January 17** Fee in effect for dropping classes  
**February 7** Last day to officially withdraw from the University without failing grades  
**February 25** Spring break (vacation)  
**March 4** Last day for graduating student in MBA, MPA, or Organizational Behavior to submit Forms No. 6a and No. 6b  
**March 11** Last day for graduating student in a thesis program to submit three copies of thesis in final form and Forms No. 6a and No. 6b to department chairman  
**March 18** Last day for graduating student in a nonthesis program to submit Forms No. 6a and No. 6b to department chairman  
**March 25** Last day for graduating student to submit final copies of thesis, project, or dissertation to Office of the Graduate Dean  
**April 1** Last day for graduating student to submit Form No. 10 (or Form No. 5b for written exams) to Office of the Graduate Dean  
 (All requirements must be completed. Diplomas will not be mailed until after grades for the previous semester or term are in.)

- April 1** Last day to officially withdraw or drop classes for any reason  
**April 18** Last day of class instruction  
**April 19-21** Final exams  
**April 22** Commencement exercises and college convocations

### Spring Term, 1977

- January 15** Final date for international graduate students to submit applications for Spring Term, 1977  
**March 15** Final date for degree-seeking graduate students to submit applications for Spring Term, 1977  
**March 18** Last day to submit advance registration forms for Spring Term, 1977  
**April 15** Final date for nondegree graduate students to submit applications for Spring Term, 1977  
**April 22** Tuition mail-in deadline for Spring Term, 1977  
**April 29** Registration for all students who did not use advance registration system  
**May 2** Class instruction begins  
**May 2** First day change in registration permitted  
**May 2** First day late registration fee assessed  
**May 9** Last day for late registration and adding classes  
**May 10** Fee in effect for dropping classes  
**May 16** Last day to officially withdraw from the University without failing grades  
**May 30** Memorial Day holiday  
**June 9** Last day to officially withdraw or drop classes for any reason  
**June 22** Last day of class instruction

### Summer Term, 1977

- March 7** Final date for international graduate students to submit applications for Summer Term, 1977  
**May 7** Final date for degree-seeking graduate students to submit applications for Summer Term, 1977  
**May 16** Last day to submit advance registration forms for Summer Term, 1977  
**June 7** Final date for nondegree graduate students to submit applications for Summer Term, 1977  
**June 20** Tuition mail-in deadline for Summer Term, 1977  
**June 24** Registration for all students who did not use advance registration system  
**June 27** Class instruction begins  
**June 27** First day change in registration permitted  
**June 27** First day late registration fee assessed  
**July 4** National holiday  
**July 6** Last day for late registration and adding classes  
**July 7** Fee in effect for dropping classes  
**July 8** Last day for graduating student in MBA, MPA, or Organizational Behavior to submit Forms No. 6a and No. 6b  
**July 12** Last day to officially withdraw from the University without failing grades  
**July 15** Last day for graduating student in a thesis program to submit three copies of thesis in final form and Forms No. 6a and No. 6b to department chairman  
**July 22** Last day for graduating student in a nonthesis program to submit Forms No. 6a and No. 6b to department chairman  
**July 25** State holiday  
**July 29** Last day for graduating student to submit final copies of thesis, project, or dissertation to Office of the Graduate Dean  
**August 5** Last day to officially withdraw or drop classes for any reason  
**August 5** Last day for graduating student to submit Form No. 10 (or Form No. 5b for written exams) to Office of the Graduate Dean  
 (All requirements must be completed. Diplomas will not be mailed until after grades for the previous semester or term are in.)  
**August 18** Last day of class instruction  
**August 19** Commencement exercises and college convocations



# Administration and Faculty

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## Graduate Council

### Representatives of Academic Areas

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Term expires September 1, 1975.  
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1975.  
Ruel A. Allred, Education. Term expires September 1,  
1975.  
Richard W. Hanks, Engineering Sciences and Technology.  
Term expires September 1, 1977.  
D. Eugene Mead, Family Living. Term expires September  
1, 1976.  
Owen S. Rich, Fine Arts and Communications. Term  
expires September 1, 1975.

## 2 ADMINISTRATION AND FACULTY

Edward L. Hart, Humanities. Term expires September 1, 1976.  
 Camilla S. Wood, Nursing. Term expires September 1, 1977.  
 Donald W. Robinson, Physical and Mathematical Sciences. Term expires September 1, 1976.  
 Donald D. Shaw, Physical Education. Term expires September 1, 1976.  
 Milton V. Backman, Jr., Religious Instruction. Term expires September 1, 1976.  
 ———, Social Sciences. Term expires September 1, 1978.

### Members at Large

Dean B. Farnsworth. Term expires September 1, 1975.  
 Arthur R. Watkins. Term expires September 1, 1976.  
 Keith P. Anderson. Term expires September 1, 1976.  
 Allen E. Bergin. Term expires September 1, 1977.  
 Chauncey C. Riddle, Dean, Graduate School, Chairman.  
 Robert W. Laird, Asst. Dean, Graduate School.

### Directors of Academic Programs

Graduate Department of Library and Information Sciences ..... H. Thayne Johnson  
 Institute of Government Service ..... Karl N. Snow, Jr.  
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 Recreation Education ..... William J. Hafen  
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 Spanish and Portuguese ..... M. Carl Gibson

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 Zoology ..... Clive D. Jorgensen

### Graduate Coordinators

Accounting ..... Dale H. Taylor  
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 Anthropology and Archaeology ..... M. Wells Jakeman  
 Art and Design ..... W. Douglas Stout  
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 Health Science ..... Donald D. Shaw  
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         Second Language (TESL) ..... Harold S. Madsen  
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 Nursing ..... Camilla S. Wood  
 Organizational Behavior ..... Paul H. Thompson  
 Physical Education ..... Donald D. Shaw  
 Physics and Astronomy ..... J. Dean Barnett  
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 Psychology ..... Donovan E. Fleming  
 Recreation Education ..... Donald D. Shaw  
 Sociology ..... Howard M. Bahr  
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 Speech and Dramatic Arts  
     Dramatic Arts ..... Karl T. Pope  
     Speech ..... Brent D. Peterson  
 Statistics ..... Gary B. Beus  
 Zoology ..... H. Duane Smith

### Coordinators of Areas

Asian Studies ..... Spencer J. Palmer  
 Latin-American Studies ..... Lyman S. Shreeve, Sr.

### The Faculty of the Graduate School

The faculty of the Graduate School consists of members of the general faculty who are approved by a committee of graduate faculty from among those who hold the rank of professor or associate professor, or assistant professor with a doctoral degree. For special reason related to



exceptional qualification, the Graduate Council is authorized to appoint to the graduate faculty a member who does not hold the doctoral degree.

## Emeriti

- Beulah Ream Allen** Professor Emeritus of Nursing (1961). Diploma, Illinois Training School for Nurses, Cook County Hospital, Chicago, Illinois, 1922; B.A., University of Utah, 1928; M.D., University of California, 1932.
- Clarence D. Ashton** Associate Professor Emeritus of Horticulture (1951). B.S., Brigham Young University, 1929.
- Owen L. Barnett** Associate Professor Emeritus of Educational Administration (1950). B.S., M.S., Brigham Young University, 1923, 1927.
- William E. Berrett** Professor Emeritus of Church History and Doctrine (1971). A.B., L.B., J.D., University of Utah, 1924, 1933, 1966; Honorary L.D., Brigham Young University, 1965.
- Loren C. Bryner** Professor Emeritus of Chemistry (1935). B.S., M.S., Brigham Young University, 1928, 1930; Ph.D., Iowa State University, 1934.
- Jennie Campbell** Associate Professor Emeritus of Education (1952). B.S., Brigham Young University, 1928; M.A., Teachers College, Columbia University, 1937.
- Clawson Y. Cannon, Sr.** Professor Emeritus of Animal Science (1956). B.S., Utah State University, 1913; M.S., Ph.D., Iowa State College, 1924, 1927.
- Thomas E. Cheney** Professor Emeritus of English (1945). B.S., Utah State University, 1930; M.A., University of Idaho, 1936.
- Monroe H. Clark** Associate Professor Emeritus of Philosophy of Education and Guidance (1945). B.A., Columbia University, 1923; M.A., Brigham Young University, 1927.
- A. John Clarke** Professor of Education (1938). B.S., M.S., Brigham Young University, 1938, 1942; Ed.D., Colorado University, 1950.
- Evan M. Croft** Associate Professor Emeritus of Business Education (1936). B.S., Brigham Young University, 1929; M.S., University of Southern California, 1940.
- Gerrit de Jong, Jr.** Professor Emeritus of Modern Languages; Dean Emeritus, College of Fine Arts (1925). B.A., M.A., University of Utah, 1920, 1925; Ph.D., Stanford University, 1933.
- G. Byron Done** Professor Emeritus of Ancient Scriptures (1956). B.A., University of Utah, 1928; M.A., Ph.D., University of Southern California, 1937, 1939.
- Roy W. Doxey** Professor Emeritus of Church History and Doctrine; Dean Emeritus, College of Religious Instruction (1948). B.A., M.A., George Washington University, 1938, 1940.
- J. Orval Ellsworth** Professor Emeritus of Religious Instruction (1954). B.S., Utah State University, 1917; M.S., Ph.D., Cornell University, 1924, 1926.
- Harvey Fletcher** Professor Emeritus of Physics; Dean Emeritus, College of Physical and Engineering Sciences (1952). B.S., Brigham Young University, 1907; Ph.D., Chicago University, 1911; hon. Sc.D., Columbia University, 1935; hon. Sc.D., Kenyon College, 1942; hon. Sc.D., Stevens Institute of Technology, 1942; hon. Sc.D., Case School of Applied Sciences, 1942; hon. Sc.D., University of Utah, 1944; hon. Sc.D., Brigham Young University, 1954.
- Nan Osmond Grass** Associate Professor of English (1951). B.A., Brigham Young University, 1930; M.A., Stanford University, 1954.
- LeRoy R. Hafen** Professor Emeritus of History (1954). B.A., Brigham Young University, 1916; M.A., University of Utah, 1919; Ph.D., University of California, 1924; Litt.D., University of Colorado, 1935.
- Wayne B. Hales** Professor Emeritus of Physics and Mathematics; Dean Emeritus, General College (1930). B.A., Brigham Young University, 1916; M.A., University of Utah, 1922; Ph.D., California Institute of Technology, 1926.
- George H. Hansen** Professor Emeritus of Geology and Geography (1927). B.S., Utah State University, 1918; M.S., Ph.D., George Washington University, 1925, 1927.
- Bertrand F. Harrison** Professor Emeritus of Botany (1929). B.S., M.S., Brigham Young University, 1930, 1931; Ph.D., University of Chicago, 1937.
- C. Lynn Hayward** Professor Emeritus of Zoology (1930). B.S., M.S., Brigham Young University, 1927, 1931; Ph.D., University of Illinois, 1941.
- Ernest C. Jeppsen** Professor Emeritus of Industrial Education (1959). B.S., Utah State University, 1926; M.S., Colorado State University, 1938.
- Hattie M. Knight** Associate Professor Emeritus of Library and Information Sciences (1941). B.S., Brigham Young University, 1941; B.S., University of Denver, 1943; M.S., George Peabody College for Teachers, 1951.
- Gustive O. Larsen** Associate Professor Emeritus of History and Religion (1954). B.A., M.A., University of Utah, 1920, 1926.
- Harold W. Lee** Professor Emeritus of French (1937). B.A., M.A., Brigham Young University, 1938, 1940; Ph.D., Stanford University, 1946.
- Wesley P. Lloyd** Professor Emeritus of Education (1935). B.S., M.S., Brigham Young University, 1927, 1934; Ph.D., University of Chicago, 1937.
- Florence Jepperson Madsen** Professor Emeritus of Music (1910). B.M., M.M., Chicago Musical College, 1926, 1927; Doctor of Music, Boguslawski College of Music, 1932; B.A., Brigham Young University, 1934; M.M., hon. Doctor of Music, Chicago College of Music, 1933.
- J. C. Moffitt** Professor Emeritus of Educational Administration (1953). B.S., M.S., Brigham Young University, 1926, 1929; Ph.D., University of Chicago, 1940.
- A. Reed Morrill** Professor Emeritus of Educational Administration (1948). B.S., M.S., Brigham Young University, 1928, 1937; Ed.D., University of Oregon, 1948.
- Sadie O. Morris** Professor Emeritus of Food and Nutrition (1957). B.S., M.S., Utah State University, 1921, 1922; Ph.D., Columbia University, 1933.
- Hugh W. Peterson** Professor Emeritus of Chemistry (1927). B.A., M.A., Brigham Young University, 1916, 1928; Ph.D., State University of Iowa, 1936.
- Antone K. Romney** Distinguished Professor Emeritus of Comparative Education; Dean Emeritus of the College of Education (1945). B.S., M.S., Brigham Young University, 1933, 1934; Ed.D., Stanford University, 1947.
- J. Wyley Sessions** Professor Emeritus of Religious Philosophy (1939). B.S., Utah State University, 1911; M.A., University of Idaho, 1928.
- Irene Osmond Spears** Professor of Humanities and Comparative Literature (1936). B.A., Brigham Young University, 1929; M.A., Ph.D., Stanford University, 1934, 1942.
- Sidney B. Sperry** Professor Emeritus of Old Testament Languages and Literature (1932). B.A., University of Utah, 1917; M.A., Ph.D., University of Chicago, 1926, 1931.
- Russel B. Swensen** Professor Emeritus of History (1933). B.A., Brigham Young University, 1926; M.A., Ph.D., University of Chicago, 1931, 1934.
- Joseph N. Symons** Professor Emeritus of Sociology (1953). B.S., M.S., Utah State University, 1927, 1932; Ph.D., University of Chicago, 1944.
- Orea B. Tanner** Associate Professor Emeritus of English (1938). B.A., Brigham Young University, 1932; M.A., Columbia University, 1953.
- Vasco M. Tanner** Professor Emeritus of Zoology (1925). B.A., Brigham Young University, 1915; M.A., University of Utah, 1920; Ph.D., Stanford University, 1925.

- L. Elliott Tuttle** Associate Professor Emeritus of Geography (1936). B.S., M.S., Brigham Young University, 1938, 1948.
- Rudger H. Walker** Professor Emeritus of Agronomy; Dean Emeritus of the College of Biological and Agricultural Sciences (1960). B.S., Brigham Young University, 1923; M.S., Ph.D., Iowa State University, 1925, 1927.
- Marguerite I. Wilson** Associate Professor Emeritus of Special Education (1956). B.S., University of Utah, 1948; M.A., San Francisco State College, 1955; Ed.D., George Peabody College for Teachers, 1965.
- Karl E. Young** Professor Emeritus of English (1930). B.A., M.A., Oxford University (England), 1930, 1934.
- Faculty**
- George M. Addy** Professor of History (1957). B.A., M.A., Brigham Young University, 1948, 1950; Ph.D., Duke University, 1957.
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- Thomas G. Alexander** Professor of History (1964). B.S., M.S., Utah State University, 1960, 1961; Ph.D., University of California at Berkeley, 1965.
- A. Lester Allen** Professor of Zoology; Dean, College of Biological and Agricultural Sciences (1954). B.A., Ph.D., University of California at Los Angeles, 1946, 1951.
- Dell K. Allen** Associate Professor of Technology (1960). B.S., Utah State University, 1954; M.S., Brigham Young University, 1966; Ed.D., Utah State University, 1973.
- James B. Allen** Professor of History (1963). B.S., Utah State University, 1954; M.A., Brigham Young University, 1956; Ph.D., University of Southern California, 1963.
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- Ruel Acord Allred** Professor of Education (1973). B.S., M.S., Brigham Young University, 1954, 1958; Ed.D., University of Oregon, 1965.
- Wallace E. Allred** Associate Professor of Secondary Education (1956). B.S., M.Ed., Brigham Young University, 1956, 1957; M.S., Oregon State University, 1964; Ph.D., University of Utah, 1971.
- Philip E. Allsen** Professor of Physical Education for Men (1966). B.S., Ricks College, 1955; M.S., Brigham Young University, 1960; Ed.D., University of Utah, 1965.
- Blaine Wright Andersen** Professor of Mechanical Engineering Science (1970). B.S., University of Utah, 1949; M.S., Ph.D., University of Illinois, 1951, 1953.
- Ferron Lee Andersen** Professor of Zoology (1966). B.S., M.S., Utah State University, 1957, 1960; M.S., University of Illinois, 1962; Ph.D., Utah State University, 1963.
- H. Verlan Andersen** Professor of Accounting (1965). B.S., Brigham Young University, 1940; J.D., Stanford University, 1946; LL.M., Harvard University, 1948.
- William Ralph Andersen** Professor of Botany (1966). B.S., M.S., Utah State University, 1956, 1958; Ph.D., University of California, 1963.
- A. Gary Anderson** Assistant Professor of Church History and Doctrine (1971). B.S., University of Utah, 1958; M.S., Ed.D., Brigham Young University, 1960, 1968.
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- Keith P. Anderson** Professor of Chemistry (1953). B.S., Brigham Young University, 1946; Ph.D., Cornell University, 1950.
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- Richard L. Anderson** Professor of History and Ancient Scripture (1955). B.A., M.A., Brigham Young University, 1951, 1957; J.D., Harvard Law School, 1954; Ph.D., University of California at Berkeley, 1962.
- Hyrum L. Andrus** Professor of Church History and Doctrine (1956). B.S., Ricks College, 1951; M.S., Brigham Young University, 1952; DSS, Syracuse University, 1955.
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- Marilyn Arnold** Assistant Professor of English (1969). B.A., M.A., Brigham Young University, 1957, 1958; Ph.D., University of Wisconsin, 1968.
- Leonard J. Arrington** Professor of History; Redd Chair of Western History; Director of the Charles Redd Center for Western Studies (1972). B.A., University of Idaho, 1939; Ph.D., University of North Carolina, 1952.
- Carlos E. Asay** Professor of Education (1969). B.S., Ed.D., University of Utah, 1953, 1967; M.A., Long Beach State College, 1958.
- Nadine Ashby** Assistant Professor of Business Education (1960). B.A., Brigham Young University, 1936; M.A., Colorado State College, 1959; Ph.D., University of North Dakota, 1971.
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- Alan C. Ashton** Assistant Professor of Computer Science (1972). B.A., Ph.D., University of Utah, 1966, 1970.
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- Milton V. Backman, Jr.** Professor of Church History and Doctrine (1960). B.S., M.A., University of Utah, 1954, 1955; Ph.D., University of Pennsylvania, 1959.
- James Logan Baer** Associate Professor of Geology (1969). B.S., Ohio State University, 1957; M.S., Ph.D., Brigham Young University, 1962, 1968.
- Howard Miner Bahr** Professor of Sociology (1973). B.A., Brigham Young University, 1962; M.A., Ph.D., University of Texas, 1964, 1965.
- Stephen Joseph Bahr** Assistant Professor of Child Development and Family Relationships (1973). B.S., M.S., Brigham Young University, 1968, 1969; Ph.D., Washington State University, 1972.
- James E. Baird** Professor of Elementary Education (1973). B.S., M.S., Brigham Young University, 1959, 1962; Ph.D., University of Utah, 1973.
- J. Hugh Baird** Professor of Education (1963). B.S., M.S., University of Utah, 1954, 1954; Ed.D., University of California at Berkeley, 1962.
- Rey L. Baird** Assistant Professor of Linguistics (1961). B.A., University of Utah, 1960; M.A., Brigham Young University, 1962; Ph.D., University of Indiana, 1974.
- Joseph O. Baker** Associate Professor of German (1967). B.A., University of Utah, 1964; Ph.D., Tulane University, 1968.



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- Jae R. Ballif** Professor of Physics; Dean, College of Physical and Mathematical Sciences (1962). B.S., Brigham Young University, 1953; M.A., Ph.D., University of California at Los Angeles, 1961, 1962.
- Blauer L. Bangerter** Professor of Physical Education (1953). B.A., Brigham Young University, 1951; M.S., Ph.D., University of Utah, 1955, 1964.
- Dee H. Barker** Professor of Chemical Engineering (1959). B.S., Ph.D., University of Utah, 1948, 1951; Registered Professional Engineer, Utah, 1963.
- Ruel Barker** Assistant Professor of Physical Education (1971). B.S., Utah State University, 1961; M.S., Ed.D., Brigham Young University, 1964, 1971.
- Howard W. Barnes** Associate Professor of Business Management (1964). A.B., Harvard College, 1955; MBA, University of Southern California, 1963; Dr. rer. pol., Technische Universität Braunschweig, 1968.
- James R. Barnes** Associate Professor of Zoology (1969). B.S., Brigham Young University, 1963; M.S., Ph.D., Oregon State University, 1967, 1972.
- J. Dean Barnett** Professor of Physics (1958). B.A., Ph.D., University of Utah, 1954, 1959.
- Ralph Dale Barney** Associate Professor of Communications (1971). B.S., Brigham Young University, 1957; M.A., University of Iowa, 1960; Ph.D., University of Missouri, 1971.
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- George S. Barrus** Professor of Communications (1967). B.S., University of Utah, 1950; M.A., Brigham Young University, 1964; Ph.D., University of Iowa, 1969.
- Calvin H. Bartholomew** Assistant Professor of Chemical Engineering (1973). B.S., Brigham Young University, 1968; M.S., Ph.D., Stanford University, 1972.
- Cliff S. Barton** Professor of Civil Engineering (1959). B.S., Utah State University, 1947; M.S., Ph.D., Rensselaer Polytechnic Institute, 1953, 1959.
- James R. Barton** Professor of Civil Engineering (1967). B.S., University of New Mexico, 1944; M.S., University of Iowa, 1946; Ph.D., Colorado State University, 1958; Registered Engineer, Utah, 1949.
- Robert W. Bass** Professor of Physics (1972). B.A., Johns Hopkins University, 1950; M.A. Oxon., Oxford University, 1952; Ph.D., Johns Hopkins University, 1955.
- J. LaVar Bateman** Professor of Speech (1949). B.A., Brigham Young University, 1941; M.S., Ph.D., University of Wisconsin, 1947, 1950.
- Edith Bartholomew Bauer** Professor of Educational Psychology (1945). B.A., M.A., Brigham Young University, 1930, 1946; Ph.D., University of California at Berkeley, 1940.
- LeRoy Wood Bearnson** Assistant Professor of Electrical Engineering (1972). BSEE, University of Utah, 1961; MSEE, Syracuse University, 1965; Ph.D., Auburn University, 1970.
- Jay V. Beck** Professor of Microbiology (1951). B.A., M.A., Brigham Young University, 1933, 1936; Ph.D., University of California at Berkeley, 1940.
- Raymond E. Beckham** Associate Professor of Communications (1970). B.S., M.A., Brigham Young University, 1949, 1969; Ph.D., Southern Illinois University, 1972.
- R. DerMont Bell** Professor of Business Education (1957). B.S., M.S., Brigham Young University, 1955, 1956; Ph.D., University of Southern California, 1960.
- Parley L. Belnap** Assistant Professor of Music (1965). B.A., M.A., Brigham Young University, 1950, 1956; Premier Prix, Royal Flemish Conservatory, Belgium, 1960; Diplôme Supérieur, Royal Flemish Conservatory, Belgium, 1964.
- W. Dwayne Belt** Professor of Secondary Education (1961). B.A., Brigham Young University, 1952; M.A., Ed.D., Colorado State College, 1958, 1961.
- Marion Bennion** Professor of Food Science and Nutrition (1952). B.S., Utah State University, 1947; M.S., Teachers College, Columbia University, 1949; Ph.D., University of Wisconsin, 1956.
- Robert C. Bennion** Professor of Psychology (1961). B.A., Brigham Young University, 1956; M.A., Ph.D., Ohio State University, 1959, 1961.
- Dale L. Berge** Associate Professor of Anthropology and Archaeology (1967). B.S., M.A., Brigham Young University, 1961, 1964; M.A., Ph.D., University of Arizona, 1967, 1968.
- Allen Eric Bergin** Professor of Psychology (1972). B.S., M.S., Brigham Young University, 1956, 1957; Ph.D., Stanford University, 1960.
- LaMar C. Berrett** Professor of Church History and Doctrine (1963). B.S., University of Utah, 1952; M.S., Ed.D., Brigham Young University, 1960, 1963.
- Paul O. Berrett** Professor of Electrical Engineering (1964). B.S., University of Utah, 1953; M.S., University of Southern California, 1955; Ph.D., University of Utah, 1965.
- Max J. Berryessa** Professor of Elementary Education (1948). B.S., M.S., Brigham Young University, 1948, 1949; Ed.D., Stanford University, 1959.
- Brian Stanley Best** Assistant Professor of English (1960). B.S., M.A., Brigham Young University, 1958, 1962; Ph.D., University of Wisconsin, 1971.
- Myron G. Best** Professor of Geology (1965). B.S., University of Utah, 1957; Ph.D., University of California at Berkeley, 1961.
- Rollie Ray Bestor** Assistant Professor of Physical Education (1969). B.S., M.S., University of Wisconsin, 1954, 1958; Ed.D., Brigham Young University, 1969.
- Gary Boyd Beus** Associate Professor of Statistics (1967). B.A., Brigham Young University, 1962; M.S., Ph.D., Virginia Polytechnic Institute, 1965, 1968.
- H. Lynn Beus** Associate Professor of Computer Science (1971). B.A., Brigham Young University, 1961; M.S., Case Institute of Technology, 1964; Ph.D., Case Western Reserve University, 1967.
- James L. Bills** Associate Professor of Chemistry (1962). B.S., University of Utah, 1958; Ph.D., Massachusetts Institute of Technology, 1963.
- Bahe Billy** Assistant Professor of Agronomy and Horticulture (1970). B.S., Utah State University, 1960; M.S., Ph.D., University of Arizona, 1964, 1970.
- Ronald D. Bingham** Assistant Professor of Educational Psychology (1971). A.A., Weber State College, 1956; B.S., Utah State University, 1961; M.Ed., Ph.D., Pennsylvania State University, 1965, 1970.
- Russell H. Bishop** Associate Professor of Education (1966). B.A., M.A., University of Utah, 1954, 1964; Ph.D., University of Oregon, 1966.
- Harold J. Bissell** Professor of Geology (1938). B.S., Brigham Young University, 1934; M.S., Ph.D., University of Iowa, 1936, 1948.
- Harvey B. Black** Professor of Education; Instructional Research Specialist (1970). A.B., M.A., Brigham Young University, 1950, 1954; Ph.D., Indiana University, 1962.
- Angus U. Blackham** Professor of Chemistry (1952). B.A., Brigham Young University, 1949; M.A., Ph.D., University of Cincinnati, 1950, 1952.
- Robert W. Blair** Professor of Linguistics (1959). B.A., M.A., Brigham Young University, 1955, 1957; Ph.D., Indiana University, 1964.
- Reed H. Blake** Associate Professor of Sociology (1967). B.S., M.S., Brigham Young University, 1957, 1959; Ph.D., Utah State University, 1968.
- Mae Blanch** Associate Professor of English (1958). B.A., Brigham Young University, 1950; Ph.D., University of Colorado, 1966.

- Howard L. Bodily** Professor of Microbiology (1972). B.S., University of Idaho, 1935; M.S., Iowa State University, 1936; Ph.D., University of Colorado, 1938.
- Gary M. Booth** Associate Professor of Zoology (1973). B.S., M.S., Utah State University, 1963, 1966; Ph.D., University of California at Riverside, 1969.
- Walter D. Bowen** Associate Professor of Church History and Doctrine (1964). B.S., M.S., Ed.D., Brigham Young University, 1957, 1958, 1965.
- Lawrence S. Bowman** Associate Professor of Electrical Engineering (1967). B.S., M.S., Ph.D., University of Utah, 1957, 1961, 1964.
- Glen L. Boyer** Assistant Professor of Business Education (1967). B.S., Utah State University, 1963; M.S., Ph.D., University of North Dakota, 1966, 1972.
- Reed H. Bradford** Professor of Sociology (1946). B.A., Brigham Young University, 1937; M.A., Louisiana State University, 1939; M.A., Ph.D., Harvard University, 1941, 1946.
- Rulon L. Bradley** Professor of Communications (1965). B.A., Brigham Young University, 1947; M.S., Ph.D., University of Utah, 1954, 1962.
- Jerald S. Bradshaw** Professor of Chemistry (1966). B.S., University of Utah, 1955; Ph.D., University of California at Los Angeles, 1963.
- Merrill Kay Bradshaw** Professor of Music (1957). B.A., M.A., Brigham Young University, 1954, 1955; M.Mus., D.Mus.A., University of Illinois, 1956, 1962.
- Willard H. Bradshaw** Associate Professor of Microbiology (1961). B.S., M.S., Brigham Young University, 1952, 1953; Ph.D., University of California at Berkeley, 1957.
- William S. Bradshaw** Assistant Professor of Zoology (1970). B.A., Harvard University, 1961; Ph.D., University of Illinois, 1968.
- Marion B. Brady** Associate Professor of English (1965). B.A., M.A., Brigham Young University, 1950, 1951; Ph.D., University of Utah, 1966.
- Lee Fred Braithwaite** Associate Professor of Zoology (1973). B.S., M.S., Ph.D., Brigham Young University, 1959, 1962, 1970.
- Ruth E. Brasher** Professor of Home Economics Education (1969). B.S., Brigham Young University, 1951; M.A., University of Maryland, 1959; Ph.D., Utah State University, 1969.
- Floyd E. Breinholt** Professor of Art (1961). B.S., M.E., Brigham Young University, 1937, 1953.
- Willis H. Brimhall** Professor of Geology (1956). B.S., Brigham Young University, 1949; M.S., University of Arizona, 1961; B.S., Brigham Young University, 1960; Ph.D., Rice University, 1966.
- Ralph A. Britsch** Professor of Humanities and Comparative Literature (1938). B.A., M.A., Brigham Young University, 1933, 1951.
- R. Lanier Britsch** Associate Professor of History (1966). B.A., M.A., Brigham Young University, 1963, 1964; Ph.D., Claremont Graduate School, 1968.
- Todd A. Britsch** Associate Professor of Humanities and Comparative Literature (1966). B.A., Brigham Young University, 1962; M.A., Ph.D., Florida State University, 1965, 1966.
- H. Smith Broadbent** Professor of Chemistry (1946). B.S., Brigham Young University, 1942; Ph.D., Iowa State University, 1946.
- Jack Devon Brotherson** Assistant Professor of Botany (1969). B.S., M.S., Brigham Young University, 1964, 1967; Ph.D., Iowa State University, 1969.
- Stephen L. Brower** Professor of Sociology (1974). B.S., M.S., Utah State University, 1949, 1950; Ph.D., Cornell University, 1961.
- Bruce Leonard Brown** Associate Professor of Psychology (1968). B.S., M.S., Brigham Young University, 1965, 1967; Ph.D., McGill University, 1969.
- J. Richard Brown** Assistant Professor of Elementary Education (1956). B.S., M.Ed., Brigham Young University, 1949, 1956.
- Key Frederick Brown** Associate Professor of Technology (1967). B.S., M.S., University of California at Los Angeles, 1959, 1964; Ph.D., University of Utah, 1973.
- S. Kent Brown** Assistant Professor of Ancient Scripture (1971). B.A., University of California, 1967; Ph.D., Brown University, 1972.
- Thomas H. Brown** Professor of French (1959). B.A., Brigham Young University, 1955; M.A., Ph.D., University of Illinois, 1957, 1960.
- Gale R. Bryce** Assistant Professor of Statistics (1972). A.A., Phoenix College, 1963; B.S., Arizona State University, 1967; M.S., Brigham Young University, 1970; Ph.D., University of Kentucky, 1972.
- Eugene Taylor Buckner** Assistant Professor of Educational Psychology; Counselor, Personal Development Center (1968). B.S., M.S., Ph.D., Brigham Young University, 1954, 1962, 1970.
- Doyle W. Buckwalter** Associate Professor of Public Administration and Political Science (1964). B.A., M.A., Brigham Young University, 1963, 1964; Ph.D., University of Michigan, 1968.
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- Kenneth C. Bullock** Professor of Geology (1943). B.S., M.A., Brigham Young University, 1940, 1942; Ph.D., University of Wisconsin, 1949.
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- Wesley R. Burr** Associate Professor of Child Development and Family Relationships (1961). B.S., M.S., Brigham Young University, 1960, 1961; Ph.D., University of Minnesota, 1967.
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- Robert C. Burton** Professor of Mathematics (1964). B.S., Brigham Young University, 1956; Ph.D., University of North Carolina, 1963.
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- James B. Cameron** Associate Professor of Accounting (1969). B.S., University of Utah, 1956; MBA, University of California at Los Angeles, 1958; CPA, Idaho, 1960; Ph.D., Montana State University, 1967.
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- Douglas M. Campbell** Associate Professor of Mathematics (1971). B.A., Harvard University, 1967; Ph.D., University of North Carolina, 1971.
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- John N. Cannon** Professor of Mechanical Engineering (1957). BSME, M.S., University of Utah, 1952, 1955; Ph.D., Stanford University, 1965; Registered Professional Engineer, Utah, 1958.
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- Gary Carlson** Professor of Computer Science; Director of Computer Services (1963). B.A., M.A., Ph.D., University of California at Los Angeles, 1956, 1958, 1962.
- G. Alvin Carpenter** Professor of Agricultural Economics (1970). B.S., Utah State University, 1936; M.S., University of California, 1937; Ph.D., Cornell University, 1952.
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- Melvin W. Carter** Professor of Statistics (1961). B.S., Arizona State College, 1953; M.S., Ph.D., North Carolina State College, 1954, 1956.
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- Edward L. Christensen** Professor of Business Management (1953). B.S., M.S., Ph.D., University of Utah, 1938, 1939, 1953.
- James J. Christensen** Professor of Chemical Engineering (1957). B.S., M.S., University of Utah, 1953, 1956; Ph.D., Carnegie Institute of Technology, 1957.
- Ross T. Christensen** Professor of Archaeology and Anthropology (1952). B.A., M.A., Brigham Young University, 1943, 1947; Ph.D., University Arizona, 1956.
- Henry N. Christiansen** Professor of Civil Engineering (1965). B.S., Utah State University, 1957; M.S., Ph.D., Stanford University, 1958, 1962.
- John R. Christiansen** Professor of Sociology (1957). B.S., M.S., Utah State University, 1949, 1952; Ph.D., University of Wisconsin, 1955.
- Bruce B. Clark** Professor of English; Dean, College of Humanities (1950). B.A., University of Utah, 1943; M.A., Brigham Young University, 1948; Ph.D., University of Utah, 1951.
- Dwight P. Clark** Associate Professor of Chemical Engineering (1964). B.S., University of Utah, 1960; Ph.D., Oregon State University, 1965.
- H. Clifford Clark** Professor of Elementary Education (1969). B.S., Ed.D., Brigham Young University, 1954, 1963; M.A., Los Angeles State College, 1957.
- Hoover W. Clark** Associate Professor of French (1964). B.A., M.A., Brigham Young University, 1954, 1958; Ph.D., Syracuse University, 1964.
- J. Reuben Clark III** Professor of French and Classical Languages (1941). B.A., University of Utah, 1934.
- James R. Clark** Professor of Ancient Scripture (1938). B.A., M.A., Brigham Young University, 1936, 1944; Ed.D., Utah State University, 1958.
- Marden J. Clark** Professor of English. (1949). B.A., M.A., Brigham Young University, 1948, 1949; Ph.D., University of Washington, 1957.
- Wayne W. Clark** Professor of Economics (1962). B.A., Brigham Young University, 1952; Ph.D., Texas A&M University, 1960.
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- John C. Clegg** Professor of Electrical Engineering (1961). B.S., M.S., Ph.D., University of Utah, 1949, 1954, 1957.

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- Coran L. Cluff** Professor of Chemistry (1960). B.S., Arizona State University, 1952; M.S., Ph.D., University of Michigan, 1955, 1960.
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- Lane A. Compton** Professor of Physical Science Education; Assistant Director of Research (1953). B.S., M.S., Ed.D., University of Utah, 1943, 1951, 1955.
- Merlin D. Compton** Professor of Spanish (1964). B.A., M.A., Brigham Young University, 1952, 1954; Ph.D., University of California at Los Angeles, 1959.
- Spencer J. Condie** Associate Professor of Sociology and University Studies (1969). B.A., Brigham Young University, 1964; M.A., University of Utah, 1965; Ph.D., University of Pittsburgh, 1969.
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- Maxine J. Cope** Professor of Nursing; Dean, College of Nursing (1970). B.S., M.S., Ed.D., University of Utah, 1948, 1957, 1967.
- Ivan L. Corbridge** Professor of Agricultural Economics (1952). B.A., Utah State University, 1946; M.S., University of Chicago, 1948; Ph.D., Washington State College, 1952.
- Milford C. Cottrell** Professor of Educational Administration (1964). B.A., University of Wyoming, 1948; M.S., Ed.D., Brigham Young University, 1956, 1961.
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- Richard H. Cracroft** Associate Professor of English (1963). B.A., M.A., University of Utah, 1961, 1963; Ph.D., University of Wisconsin, 1970.
- Marshall R. Craig** Professor of English (1953). B.S., Brigham Young University, 1941; M.A., Ph.D., Columbia University, 1947, 1968.
- Wesley W. Craig** Associate Professor of Sociology (1967). B.A., Brigham Young University, 1956; Ph.D., Cornell University, 1967.
- John M. Crandell, Jr.** Associate Professor of Special Education (1970). B.A., M.A., Arizona State University, 1951, 1957; Ph.D., University of Texas, 1966.
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- Bert P. Cundick** Professor of Psychology (1962). B.A., M.S., University of Utah, 1957, 1959; Ph.D., Ohio State University, 1962.
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- Delva Daines** Professor of Elementary Education (1955). B.S., M.S., Utah State University, 1940, 1947; Ed.D., Washington State University, 1956.
- Robert H. Daines** Professor of Business Management (1959). B.S., Utah State University, 1956; MBA, Stanford University, 1959; DBA, Indiana University, 1966.
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- Alexander B. Darais** Associate Professor of Art (1954). B.S., Brigham Young University, 1948; MFA, Claremont Graduate School, 1952.
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- D. Evan Davis** Professor of Music (1965). B.A., University of California at Los Angeles, 1946; M.Mus., Northwestern University, 1948; Ed.D., University of Oregon, 1953.
- Garold Neil Davis** Professor of German (1973). B.A., M.A., Brigham Young University, 1958, 1959; Ph.D., Johns Hopkins University, 1962.
- C. Edwin Dean** Associate Professor of Computer Science (1949). B.S., M.S., Brigham Young University, 1948, 1952; M.S., University of Michigan, 1955.
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- Dwight R. Dixon** Professor of Physics (1959). B.S., Utah State University, 1942; Ph.D., University of California at Berkeley, 1955.
- David M. Donaldson** Professor of Microbiology (1955). B.S., M.S., Ph.D., University of Utah, 1950, 1952, 1954.
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- Raymond B. Farnsworth** Professor of Agronomy (1946). B.S., Brigham Young University, 1937; M.S., Massachusetts State College, 1938; Ph.D., Ohio State University, 1941.
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- Lawrence Fearnley** Professor of Mathematics (1957). B.S., London University, 1953; Ph.D., University of Utah, 1959; Ph.D., University of London, 1970.
- Helaman R. P. Ferguson** Assistant Professor of Mathematics (1971). A.B., Hamilton College, 1962; M.S., Brigham Young University, 1966; M.S., Ph.D., University of Washington, 1969, 1971.
- D. Allan Firmage** Professor of Engineering (1955). B.S., University of Utah, 1940; M.S., Massachusetts Institute of Technology, 1941; Registered Engineer, Florida, 1948, Utah, 1956.
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- Donovan E. Fleming** Professor of Psychology (1971). B.S., M.S., Brigham Young University, 1956, 1957; Ph.D., Washington State University, 1962.
- Marvin H. Folsom** Professor of German (1961). B.A., M.A., Brigham Young University, 1956, 1957; Ph.D., Cornell University, 1961.
- Glen Ray Foster** Assistant Professor of Economics (1967). B.S., Utah State University, 1963; Ph.D., University of Texas, 1970.
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- Joseph C. Free** Professor of Mechanical Engineering (1961). B.S., Brigham Young University, 1958; M.S., California Institute of Technology, 1961; Ph.D., Massachusetts Institute of Technology, 1967.
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- Herbert H. Frost** Professor of Zoology (1960). B.A., M.A., Brigham Young University, 1941, 1947; Ph.D., Cornell University, 1955.
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- Dean K. Fuhrman** Professor of Civil Engineering (1954). B.S., M.S., Utah State University, 1941, 1950; Ph.D., University of Wisconsin, 1952; Registered Professional Engineer, Utah, 1946, Nevada, 1962.
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- Andrew L. Gardner** Professor of Physics (1964). B.S., Utah State University, 1940; Ph.D., University of California at Berkeley, 1955.
- John H. Gardner** Professor of Physics (1949). B.S., Utah State University, 1943; M.A., Ph.D., Harvard University, 1947, 1950.
- Robert Wayne Gardner** Professor of Animal Science (1966). B.S., Utah State University, 1958; M.S., Ph.D., Cornell University, 1960, 1962.
- Willard Hale Gardner** Associate Professor of Computer Science; Assistant Director, Manager of Computer Research Center (1963). B.S., Utah State University, 1948; M.S., Brigham Young University, 1956.
- Lynn E. Garner** Associate Professor of Mathematics (1963). B.S., Brigham Young University, 1962; M.A., University of Utah, 1964; Ph.D., University of Oregon, 1968.
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- Ray H. Garrison** Associate Professor of Accounting (1966). B.S., M.S., Brigham Young University, 1960, 1961; CPA, Colorado, 1962; DBA, Indiana University, 1966.
- Byron W. Gassman** Professor of English (1960). B.A., Brigham Young University, 1955; M.A., Ph.D., University of Chicago, 1956, 1960.
- Edward A. Geary** Assistant Professor of English (1968). B.A., M.A., Brigham Young University, 1960, 1963; Ph.D., Stanford University, 1971.
- Burton C. Gee** Professor of Mathematics (1960). B.S., Brigham Young University, 1951; M.S., Ed.D., Oregon State University, 1958, 1965.
- Nephi Georgi** Associate Professor of German (1974). B.A., M.A., Ph.D., University of Utah, 1949, 1951, 1966.

- J. Douglas Gibb** Associate Professor of Speech and Dramatic Arts (1969). B.S., M.A., University of Utah, 1963, 1964; Ph.D., Wayne State University, 1966.
- Rendol L. Gibbons** Associate Professor of Music (1964). B.A., M.A., Northern Arizona University, 1947, 1954; Ph.D., University of Colorado, 1969.
- M. Carl Gibson** Professor of Spanish (1949). B.A., M.A., Brigham Young University, 1947, 1949; Ph.D., University of Oregon, 1960.
- Gurcharan S. Gill** Professor of Mathematics (1960). B.S., Brigham Young University, 1958; M.S., Ph.D., University of Utah, 1960, 1965.
- Joseph M. Glassett** Associate Professor of Chemical Engineering (1966). B.S., University of Utah, 1947; M.S., Massachusetts Institute of Technology, 1948; Registered Professional Engineer, 1956.
- Preston R. Gledhill** Professor of Dramatic Arts (1947). Degré Supérieur, La Sorbonne, 1938; B.A., Brigham Young University, 1939; M.A., Louisiana State University, 1940; Ph.D., University of Wisconsin, 1951.
- J. Rex Goates** Professor of Chemistry (1947). B.S., Brigham Young University, 1942; Ph.D., University of Wisconsin, 1947.
- A. Harold Goodman** Professor of Music (1960). B.A., University of Arizona, 1947; M.Mus., Ed.D., University of Southern California, 1951, 1960.
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- Alan H. Grey** Associate Professor of Geography (1964). B.A., Brigham Young University, 1959; M.A., Ph.D., University of Wisconsin, 1960, 1963.
- Earl Louis Grossen** Assistant Professor of Secondary Education (1971). B.S., University of Utah, 1958; Special Diplomas, University of Michigan and American University at Beirut, 1962, 1964; M.A. equivalent, University of Washington, 1967; Ph.D., University of Utah, 1971.
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- Stewart L. Grow** Distinguished Professor of History and Political Science (1947). B.S., M.S., Brigham Young University, 1935, 1948; Ph.D., University of Utah, 1954.
- Clark J. Gubler** Professor of Chemistry (1958). B.A., Brigham Young University, 1939; M.A., Utah State University, 1941; Ph.D., University of California, 1945.
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- Richard L. Gunn** Professor of Art and Education (1948). B.S., M.S., Brigham Young University, 1947, 1950; Ed.D., Stanford University, 1955; Banff School of Fine Arts.
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- Harold I. Hansen** Professor of Dramatic Arts (1952). B.S., Utah State University, 1937; M.A., Ph.D., State University of Iowa, 1940, 1949.
- H. Kimball Hansen** Professor of Physics and Astronomy (1963). B.S., M.S., Brigham Young University, 1957, 1959; Ph.D., University of California at Berkeley, 1966.
- Lee D. Hansen** Associate Professor of Chemistry (1972). B.S., Ph.D., Brigham Young University, 1962, 1965.
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- James Roy Harris** Assistant Professor of Ancient Scripture (1966). B.S., M.A., Ed.D., Brigham Young University, 1952, 1958, 1965.
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- Ruth Merrill Walker** Assistant Professor of Food Science and Nutrition (1972). B.Sc., University of Alberta, 1941; M.S., Washington State University, 1943; Ph.D., University of Wisconsin, 1972.
- Steven C. Walker** Assistant Professor of English (1966). B.S., M.A., Brigham Young University, 1965, 1966; Ph.D., Harvard University, 1973.
- Max V. Wallentine** Professor of Animal Science; Assistant Dean, College of Biological and Agricultural Sciences (1962). B.S., Utah State University, 1955; M.S., Ph.D., Cornell University, 1956, 1960.
- Charles N. Walter** Assistant Professor of Mathematics (1969). B.S., M.A., Ph.D., University of New Mexico, 1963, 1965, 1969.
- Wilbur T. Walton** Assistant Professor of Educational Psychology (1971). B.A., Brigham Young University, 1957; M.S., Ph.D., University of Utah, 1965, 1969.
- C. Terry Warner** Associate Professor of Philosophy; Dean, College of General Studies (1967). B.A., Brigham Young University, 1963; M.A., Ph.D., Yale University, 1965, 1967.
- Charles Young Warner** Professor of Mechanical Engineering (1966). B.S., M.S., Brigham Young University, 1957, 1963; Ph.D., University of Michigan, 1966; Registered Professional Engineer, Utah, 1967.
- S. Elvon Warner** Associate Professor of Business Education (1961). B.S., M.S., Brigham Young University, 1960; Ed.D., Arizona State University, 1968.
- Ted J. Warner** Professor of History (1962). B.S., M.S., Brigham Young University, 1955, 1958; Ph.D., University of New Mexico, 1964.
- W. Keith Warner** Professor of Sociology (1971). B.S., M.S., Utah State University, 1958, 1959; Ph.D., Cornell University, 1960.
- F. Delmar Wasden** Associate Professor of Educational Administration (1971). B.S., M.Ed., Ed.D., Brigham Young University, 1961, 1966, 1971.
- Max L. Waters** Professor of Business Education (1958). B.A., M.Ed., Brigham Young University, 1958, 1960; Ed.D., Colorado State College, 1963.



- Jean Anne Waterstradt** Associate Professor of English (1945). B.A., Brigham Young University, 1945; M.A., University of Southern California, 1955.
- Arthur R. Watkins** Professor of German (1952). B.A., M.A., Brigham Young University, 1941, 1942; Ph.D., Stanford University, 1948.
- Ray Watters** Professor of Health Science (1957). B.S., M.S., Utah State University, 1948, 1950; HSD, Indiana University, 1960.
- Stanley H. Watts** Associate Professor of Physical Education; Director of Athletics (1947). B.S., Brigham Young University, 1938.
- Max D. Weaver** Professor of Art (1961). B.S., M.A., Utah State University, 1939, 1955.
- Ross Maughan Weaver** Associate Professor of Educational Psychology (1959). B.S., M.S., Utah State University, 1950, 1951; Ph.D., University of Oklahoma, 1970.
- Clark D. Webb** Assistant Professor of Secondary Education and Foundations (1966). B.A., M.A., Brigham Young University, 1962, 1966; Ph.D., University of Texas at Austin, 1970.
- Darrell Jack Weber** Professor of Botany (1969). B.S., M.S., University of Idaho, 1958, 1959; Ph.D., University of California at Davis, 1963.
- David G. Weight** Assistant Professor of Psychology (1969). B.A., M.S., Brigham Young University, 1963, 1965; Ph.D., University of Washington, 1969.
- M. Gawain Wells** Assistant Professor of Psychology (1972). A.Sc., Dixie Junior College, 1964; B.S., M.S., Brigham Young University, 1967, 1968; Ph.D., Purdue University, 1972.
- Stanley L. Welsh** Professor of Botany (1960). B.S., M.S., Brigham Young University, 1951, 1957; Ph.D., Iowa State University, 1960.
- Dale H. West** Professor of English (1947). B.A., Brigham Young University, 1940; M.A., University of Southern California, 1955; Ed.D., University of Colorado, 1962.
- Harold F. Western** Associate Professor of Accounting (1972). B.S., M.S., Brigham Young University, 1954, 1960.
- Lorin F. Wheelwright** Professor of Music (1967). B.S., University of Utah, 1930; M.A., University of Chicago, 1931; Ph.D., Columbia University, 1938.
- Clayton M. White** Associate Professor of Zoology (1970). B.A., Ph.D., University of Utah, 1961, 1968.
- David Arnold White** Assistant Professor of Zoology (1966). B.S., M.S., Brigham Young University, 1961, 1964; Ph.D., University of Wisconsin, 1967.
- Fred G. White** Professor of Chemistry (1961). B.S., M.S., Brigham Young University, 1952, 1956; Ph.D., University of California, 1961.
- Armand T. Whitehead** Assistant Professor of Zoology (1969). B.S., Brigham Young University, 1965; Ph.D., University of California at Berkeley, 1969.
- Gordon C. Whiting** Associate Professor of Communications (1974). B.A., University of Minnesota, 1959; M.A., University of Utah, 1961; Ph.D., Michigan State University, 1967.
- Charles W. Whitman** Associate Professor of Dramatic Arts (1965). B.A., M.A., Brigham Young University, 1957, 1958; Ph.D., University of Minnesota, 1966.
- Leslie Whitton** Associate Professor of Botany (1962). B.S., Utah State University, 1949; M.S., University of California at Davis, 1953; Ph.D., Cornell University, 1964.
- Harry E. Wickes** Associate Professor of Mathematics (1957). B.S., M.Ed., Brigham Young University, 1950, 1954; M.Ed., Harvard University, 1962; Ed.D., Colorado State College, 1967.
- Marjorie Wight** Assistant Professor of English (1963). B.A., Brigham Young University, 1943; M.A., University of California at Los Angeles, 1958; Ph.D., University of Southern California, 1967.
- Theodore A. Wight** Assistant Professor of Mathematics (1963). B.S., M.S., Ed.D., University of Utah, 1955, 1964, 1969.
- Ray T. Wilcox** Associate Professor of Secondary Education (1957). B.S., M.Ed., Brigham Young University, 1951, 1954; Ed.D., University of California at Berkeley, 1957.
- Doran F. Wilkes** Associate Professor of Civil Engineering (1967). B.S., M.S., Utah State University, 1951, 1955; Ed.D., University of Missouri, 1966.
- Ernest L. Wilkinson** Professor of Political Science; Editor and Director of Centennial History; President Emeritus (1951). B.A., Brigham Young University, 1921; J.D., George Washington University, 1926; SJD, Harvard University, 1927; hon. LL.D., Brigham Young University, 1957; hon. DPS, Fort Lauderdale, 1970; hon. LL.D., Grove City College, 1971.
- Milton G. Wille** Professor of Mechanical Engineering (1964). B.A., BES, Brigham Young University, 1957, MSME, California Institute of Technology, 1958; Ph.D., University of Michigan, 1964; Registered Professional Engineer, Utah, 1965.
- C. Frank Williams** Assistant Professor of Agronomy and Horticulture (1970). B.S., M.S., Utah State University, 1967, 1968; Ph.D., Oregon State University, 1971.
- David K. Williams** Associate Professor of Educational Psychology (1974). B.S., M.S., Brigham Young University, 1964; Ph.D., University of Missouri-Columbia, 1973.
- Gary Shelton Williams** Assistant Professor of Asian Languages (1966). B.A., Brigham Young University, 1962; Ph.D., University of Washington, 1973.
- Glenn R. Williams** Professor of Music (1965). B.A., Brigham Young University, 1953; M.M., DMA, Eastman School of Music, 1954, 1961.
- Ray S. Williams** Associate Professor of English (1966). A.B., Coker College, 1960; M.A., Ph.D., Florida State University, 1962, 1965.
- Arnold Wilson** Associate Professor of Civil Engineering (1957). B.S., M.S., Brigham Young University, 1957, 1962; Registered Professional Engineer, Utah, 1963.
- Byron J. Wilson** Professor of Chemistry (1965). B.S., Idaho State College, 1955; M.A., Southern Illinois University, 1958; Ph.D., University of Washington, 1961.
- Grant M. Wilson** Associate Professor of Chemical Engineering (1972). B.S., Brigham Young University, 1953; Ph.D., Massachusetts Institute of Technology, 1958.
- Warren B. Wilson** Professor of Art and Education (1954). B.S., Utah State University, 1943; MFA, State University of Iowa, 1949.
- William A. Wilson** Assistant Professor of English (1960). B.A., M.A., Brigham Young University, 1958, 1962; Ph.D., University of Indiana, 1974.
- Larry T. Wimmer** Associate Professor of Economics (1963). B.S., Brigham Young University, 1960; M.A., Ph.D., University of Chicago, 1962, 1968.
- H. Geneva Winterrose** Associate Professor of Elementary Education (1967). B.S., M.S., Brigham Young University, 1948, 1951; Ed.D., Utah State University, 1968.
- Edward J. Winward** Associate Professor of Educational Psychology; Counselor, Personal Development Center (1959). B.S., M.S., Utah State University, 1959, 1960; Ph.D., University of Missouri, 1966.
- Harold F. Wolfgramm** Professor of Secondary Education (1966). B.S., M.S., Ph.D., University of Utah, 1959, 1960, 1964.
- Heber G. Wolsey** Professor of Communications; Assistant to President in Charge of Communications (1963). B.S., Brigham Young University, 1942; M.A.,

- Northwestern University, 1949; Ph.D., Michigan State University, 1967.
- Benjamin W. Wood** Assistant Professor of Botany (1971). B.S., M.S., Brigham Young University, 1963, 1967; Ph.D., Oregon State University, 1971.
- Camilla S. Wood** Associate Professor of Nursing (1973). B.S., M.S., Ph.D., University of Utah, 1947, 1960, 1972.
- Glena D. Wood** Professor of English (1952). B.A., Brigham Young University, 1936; M.A., Ph.D., University of Kentucky, 1949, 1958.
- Joseph S. Wood** Assistant Professor of History (1967). B.S., Ph.D., University of Utah, 1939, 1967.
- Lowell D. Wood** Associate Professor of Agricultural Economics and Economics (1969). B.S., Brigham Young University, 1961; M.S., Montana State University, 1966; Ph.D., University of California at Berkeley, 1969.
- Stephen L. Wood** Professor of Zoology (1956). B.S., M.S., Utah State University, 1946, 1948; Ph.D., University of Kansas, 1953.
- Lael J. Woodbury** Professor of Dramatic Arts; Dean, College of Fine Arts and Communications (1965). B.S., Utah State University, 1952; M.A., Brigham Young University, 1953; Ph.D., University of Illinois, 1954.
- Richard C. Woodbury** Professor of Electrical Engineering (1959). B.S., University of Utah, 1956; M.S., Ph.D., Stanford University, 1958, 1965.
- Leon W. Woodfield** Professor of Accounting (1960). B.S., MBA, University of Utah, 1956, 1957; CPA, California, 1959, Utah, 1960; DBA, Michigan State University, 1965.
- Hugh James Woodford** Associate Professor of Physics (1968). Diploma, Public Administration, University of Sidney, Australia, 1948; B.S., M.S., Brigham Young University, 1952, 1955; Ph.D., University of Utah, 1966.
- Ralph Woodward** Professor of Music (1955). B.A., University of Idaho, 1937; M.M., Cincinnati Conservatory of Music, 1948; DMA, University of Illinois, 1964.
- Earl M. Woolley** Associate Professor of Chemistry (1970). B.S., Ph.D., Brigham Young University, 1966, 1969.
- Ronald L. Woolley** Assistant Professor of Mechanical Engineering (1974). Ph.D., Stanford, 1974.
- Richard R. Wootton** Associate Professor of Education (1963). B.S., Ph.D., Brigham Young University, 1966, 1969.
- Donald N. Wright** Associate Professor of Microbiology (1969). B.S., University of Utah, 1958; Ph.D., Iowa State University, 1964.
- H. Curtis Wright** Associate Professor of Library and Information Sciences (1969). B.A., M.A., Brigham Young University, 1954, 1955; M.A., University of Southern California, 1959; M.S., Ph.D., Case Western Reserve University, 1968, 1969.
- N. Dale Wright** Assistant Professor of Public Administration (1968). B.S., M.S., Brigham Young University, 1964, 1966; Ph.D., University of Southern California, 1972.
- Jan E. Wynn** Assistant Professor of Mathematics (1966). B.S., University of Idaho, 1962; M.S., Utah State University, 1965; Ph.D., Colorado State University, 1972.
- David H. Yarn, Jr.** Professor of Philosophy (1950). B.A., Brigham Young University, 1946; M.A., Ed.D., Columbia University, 1949, 1958.
- Paul H. Yearout** Professor of Mathematics. (1962). B.A., Reed College, 1949; M.S., Ph.D., University of Washington, 1958, 1961.
- James Robert Young** Assistant Professor of Elementary Education (1971). B.A., M.Ed., Brigham Young University, 1965, 1966; Ph.D., George Peabody College, 1970.

On authorization by the Graduate Council the service of members of the graduate faculty will be supplemented by that of other members of the University faculty whose advanced training and effective academic work in highly specialized fields qualify them for service in the graduate program.



1890s assembly in Room D of the Academy (Education) Building.





# General Information

## History and Purpose

Brigham Young University was founded as an academy of The Church of Jesus Christ of Latter-day Saints in 1875. It became a university in 1903. The first graduate program began in 1916; the first master's degree was awarded in 1919. Some doctoral programs were inaugurated in 1957, with the first doctorates awarded in 1961.

The purpose of the Graduate School is to promote quality programs for academic and professional education as a means of meliorating the conditions of human life. Acute intellectual ability coupled with deep moral and spiritual commitment is seen as the ideal.

## Organization

### The Graduate Dean

The dean is responsible for leadership and administration of the entire Graduate School. The Office of the Graduate Dean has as its principal function the processing and maintenance of student records, while assuring high quality in individual student programs.

### The Graduate Council

This council is composed of members elected from the graduate academic areas of the University and is presided over by the graduate dean. This body recommends policy for the Graduate School as a whole, processes all proposals for new degree programs, and conducts a continuous review of existing programs.

### College Deans, Department Chairmen, and Graduate Coordinators

These individuals implement graduate programs under approved policies and serve a critical quality-control function relative to individual student programs.

### The Graduate Faculty

Specially qualified members of the University faculty constitute the graduate faculty. Close professional and personal association of students with graduate faculty in learning, research, and teaching experiences helps provide students with the knowledge, skills, and judgment of a highly competent professional person.

### Graduate Student Council Committee

Student representatives from the graduate academic areas are members of this committee. They consult on procedures for upgrading the Graduate School and conduct schoolwide academic and social student functions.

## Graduate Degrees

The Graduate School offers the master's degree in more than eighty-five fields distributed through forty-nine

graduate departments and the doctor's degree in more than forty fields distributed through twenty-two graduate departments as follows:

### Doctor of Philosophy

#### Botany and Range Science

- Botany
- Genetics

#### Chemistry

- Analytical-Physical Chemistry
- Biochemistry
- Inorganic Chemistry
- Organic Chemistry
- Physical Chemistry

#### Child Development and Family Relationships

- Child Development
- Family Relationships
- Marriage and Family Counseling

#### Educational Psychology

- Counseling and Guidance
- Educational Psychology
- Instructional Psychology
- Special Education

#### Engineering

- Chemical Engineering Science
- Civil Engineering Science
- Electrical Engineering Science
- Mechanical Engineering Science

#### English

- American Literature
- English Literature

#### French and Italian

- French Language
- French Literature
- French Teaching Emphasis

#### Geology

- Economic Geology
- Mineralogy, Geochemistry, and Petrology
- Paleontology
- Stratigraphy and Sedimentation
- Structural and Field Geology

#### Germanic Language

- German Language
- German Literature
- German Teaching Emphasis

#### History

- American History
- Modern European History

#### Microbiology

- Genetics
- Microbiology

#### Music

- Physics and Astronomy
  - Acoustics
  - Astrophysics
  - Atomic Physics and Spectroscopy
  - Biophysics
  - Nuclear Physics
  - Planetary and Space Physics
  - Plasma Physics
  - Solid-State Physics
  - Theoretical Physics
- Psychology
  - Clinical Psychology
  - General Psychology
  - Instructional Psychology
- Sociology
  - Family Sociology
  - Social Organization
  - Social Psychology
- Spanish and Portuguese
  - Spanish Language
  - Spanish Literature
  - Spanish Teaching Emphasis
- Speech and Dramatic Arts
  - Dramatic Arts
- Zoology
  - Entomology
  - Genetics
  - Zoology
- Doctor of Education**
- Business Education
- Educational Administration
  - Community College Administration
  - Community School Administration
  - Public School Administration
- Educational Psychology
  - Counseling and Guidance
  - Educational Psychology
  - Special Education
- Elementary Education
  - Elementary Curriculum and Instruction
- Physical Education
  - Analysis of Human Motions
  - Professional Leadership
- Secondary Education and Foundations
  - Secondary Curriculum and Instruction
- Master of Arts**
- Anthropology and Archaeology
  - Historic Archaeology
  - Prehistoric Archaeology
- Art
  - Design
  - Painting and Sculpture
- Asian Studies
- Chemistry
  - Chemistry Teaching Emphasis
- Classical, Biblical, and Middle Eastern Languages
  - Greek
  - Latin
  - Latin Teaching Emphasis
- Communications
- Educational Psychology
  - Communicative Disorders
  - Counseling and Guidance
  - Educational Psychology
  - Instructional Media
  - School Psychology (interdepartmental)
  - Special Education
- Elementary Education
  - Elementary Curriculum and Instruction
  - Reading Specialist
- English
  - American Literature
  - English Language
  - English Literature
- French and Italian
  - French Language
  - French Literature
  - French Teaching Emphasis
- Geology
  - Earth Science Teaching Emphasis
- Germanic Languages
  - German Language
  - German Literature
  - German Teaching Emphasis
- History
  - Asia (with Asian Studies)
  - American History
  - Modern European History
  - Latin America (with Latin American Studies)
  - History Teaching Emphasis
- Humanities and Comparative Literature
  - Comparative Literature
  - Humanities
- Latin American Studies
- Linguistics
  - Applied Linguistics
  - Teaching English as a Second Language (TESL)
  - Theoretical Linguistics
- Mathematics
  - Mathematics
  - Mathematics Education
- Music
  - Music Education
  - Musicology
  - Music Theory
- Organizational Behavior
- Physical Education
  - Dance
  - Professional Leadership
- Physics and Astronomy
  - Physics Teaching Emphasis
- Political Science
- Recreation Education
  - Community School Leadership
  - Municipal Recreation Administration
  - Outdoor Recreation
  - Therapeutic Recreation
- Spanish and Portuguese
  - Portuguese Language
  - Portuguese Literature
  - Spanish Language
  - Spanish Literature
  - Spanish Teaching Emphasis
- Speech and Dramatic Arts
  - Dramatic Arts
  - Speech
- Master of Science**
- Agriculture
  - Agribusiness
  - Agronomy
  - Animal Science
  - Horticulture
- Botany and Range Science
  - Biological Science Education
  - Botany
  - Genetics
  - Range Science
- Business Education
  - Distributive Education
  - Office Education
- Chemical Engineering Science
  - Combustion
  - Environmental Control
  - Fluid Mechanics (with Mechanical Engineering)
  - Nuclear Engineering (with Physics)
  - Thermodynamics
- Chemistry
  - Analytical-Physical Chemistry
  - Biochemistry

Inorganic Chemistry  
 Organic Chemistry  
 Physical Chemistry  
 Child Development and Family Relationships  
 Child Development  
 Family Relationships  
 Marriage and Family Counseling  
 Civil Engineering Science  
 Highway Engineering  
 Water Resources and Environmental Engineering  
 Structures and Structural Mechanics  
 Computer Science  
 Information Systems  
 Formal Languages and Automata Theory  
 Machine Organization  
 Programming Systems  
 Theory of Computation  
 Economics  
 Electrical Engineering Science  
 Communications Engineering  
 Computer Engineering  
 Power Engineering  
 Solid-State Electronics  
 Food Science and Nutrition  
 Geography  
 Cartography  
 General Geography  
 Urban and Regional Planning  
 Geology  
 Economic Geology  
 Mineralogy, Geochemistry, and Petrology  
 Paleontology  
 Stratigraphy and Sedimentation  
 Structural and Field Geology  
 Health Sciences  
 Community Health  
 Health Education  
 Safety Education  
 Home Economics Education  
 Industrial Education  
 Technical Education  
 Technology  
 Mathematics  
 Mechanical Engineering Science  
 Applied Mechanics  
 Machine Design  
 Manufacturing  
 Nuclear Engineering (with Physics)  
 Thermosciences  
 Microbiology  
 Genetics  
 Medical Technology  
 Microbiology  
 Physical Education  
 Analysis of Human Motions  
 Professional Leadership  
 Physics and Astronomy  
 Acoustics  
 Astrophysics  
 Atomic Physics and Spectroscopy  
 Biophysics  
 Nuclear Physics  
 Planetary and Space Physics  
 Plasma Physics  
 Solid-State Physics  
 Theoretical Physics  
 Psychology  
 School Psychology (interdepartmental)  
 Sociology  
 General Sociology  
 Speech and Dramatic Arts  
 Clinical Audiology  
 Speech Science  
 Statistics  
 Applied Statistics  
 Theoretical Statistics

Zoology  
 Biological Science Education  
 Entomology  
 Genetics  
 Zoology

#### **Master of Accountancy**

Accounting

#### **Master of Business Administration**

Business Administration

#### **Master of Education**

Educational Administration  
 Community School Administration  
 Elementary School Administration  
 Secondary School Administration  
 Educational Psychology  
 Counseling and Guidance  
 Educational Psychology  
 Instructional Media  
 School Psychology (interdepartmental)  
 Special Education  
 Elementary Education  
 Elementary Curriculum and Instruction  
 Reading Specialist  
 Secondary Education and Foundations  
 Comparative and International Education  
 Secondary Curriculum and Instruction

#### **Master of Fine Arts**

Art  
 Design  
 Painting and Sculpture

#### **Master of Engineering**

Chemical Engineering Science  
 Combustion  
 Environmental Control  
 Fluid Mechanics (with Mechanical Engineering)  
 Nuclear Engineering (with Physics)  
 Thermodynamics  
 Civil Engineering Science  
 Highway Engineering  
 Water Resources and Environmental Engineering  
 Structures and Structural Mechanics  
 Electrical Engineering Science  
 Communications Engineering  
 Computer Engineering  
 Power Engineering  
 Solid-State Electronics  
 Mechanical Engineering Science  
 Applied Mechanics  
 Machine Design  
 Manufacturing  
 Nuclear Engineering (with Physics)  
 Thermosciences

#### **Master of Health Education**

Health Sciences  
 Community Health  
 Health Education  
 Safety Education

#### **Master of Industrial Education**

Industrial Education

#### **Master of Library Science**

Graduate Department of Library and Information Science  
 Library Science

#### **Master of Music**

Music  
 Performance

#### **Master of Nursing**

Nursing  
 Cardiovascular Nursing Specialist  
 Family Nurse Practitioner



Neurological Nursing Specialist  
Oncological Nursing Specialist

#### Master of Public Administration

Institute of Government Service  
Government Service

#### Master of Recreation Education

Recreation Education  
Municipal Recreation Administration  
Outdoor Recreation  
Therapeutic Recreation

Minors are offered in the fields listed above in addition to the following fields:

Ancient Scripture  
Art History  
Basic Chemistry  
Business Management  
Church History and Doctrine  
Philosophy

#### Certificate Programs

Educational Specialist  
Educational Administration  
Community School Administration  
Public School Administration  
Supervision  
Educational Psychology  
Counseling and Guidance  
Special Education  
Elementary Education  
Elementary Curriculum and Instruction  
Reading Specialist  
Secondary Education and Foundations  
Secondary Curriculum and Instruction

#### Teaching English as a Second Language (TESL)

Linguistics  
French  
German  
Portuguese  
Spanish

## General Regulations

It is the responsibility of each student in the Graduate School to know and conform both to the following general regulations and to the additional requirements of his department. These general regulations may change from year to year. Students should consult the **Graduate School Catalog** each year to be aware of current regulations.

### University Standards

The maintenance of high standards of honor, integrity, and morality; of graciousness in personal behavior; of Christian ideals in everyday living; and the complete abstinence from alcohol and tobacco are required of every student while on the campus, at home, or wherever he may be as long as he is in student status. Registration signifies a student's willingness to conform to these standards. A copy of the BYU Code of Honor may be found on page 38 of this catalog.

Any pronouncement of disciplinary measures made by the President of the University becomes a part of these regulations. Violations of these regulations make the offender liable to suspension from the University.

### Admission

Admission to the Graduate School is contingent upon the completion of the bachelor's degree or its equivalent from an accredited institution.

Students of any race, creed, color, or national origin are accepted for admission to Brigham Young University

provided they maintain ideals and standards in harmony with those of The Church of Jesus Christ of Latter-day Saints and meet the University's academic requirements.

Applications for admission may be obtained from the University Office of Admissions by a written request to the University Mail Answering Service, 268 UPB. Be sure to specify whether you desire a degree-seeking or a non-degree application.

A grade-point average of 3.0 is the minimum acceptable for regular degree-seeking status. Students with undergraduate grade-point averages of less than 2.5 are not eligible for admission on either degree-seeking or non-degree status.

In addition to academic qualifications, every student who is not a U.S. citizen must—

1. submit evidence of English proficiency,
2. submit the General Information Confidential Statement of Finance Form to the Office of University Admissions prior to being accepted,
3. register for a minimum of nine (9) credit hours each semester.

Each international student should keep in close contact with the International Student Office while he is on the BYU campus.

Admission to the Graduate School is contingent upon acceptance in a particular department and program as a degree-seeking student. To be considered, applications must include each of the following items and be filed before the announced deadlines:

1. Fully completed application form
2. Nonrefundable application fee of \$15
3. Two official transcripts of all college work (BYU transcripts may be unofficial)
4. Three letters of recommendation on the forms provided
5. Confidential interview form
6. Letter of intent
7. Letter requesting use of credit previously obtained (if any)

Each student is responsible for making sure his application is completed and in the Admissions Office, A-153 ASB (including the confidential report and all letters of recommendation) by the appropriate deadline.

Each applicant is notified in writing by the Graduate School concerning his admission or nonadmission. Application deadlines are as follows (Some departments have other deadlines. Please see departmental information):

### Deadlines for Graduate School Applications

	Degree	Nondegree	International Student
1975-76			
Spring Term	15 March	15 April	15 January
Summer Term	10 May	10 June	10 March
Fall Semester	5 July	5 August	5 May
Winter Semester	5 November	5 December	5 September
Spring Term	15 March	15 April	15 January
Summer Term	10 May	10 June	10 March

### Student Classification

#### Degree-seeking Status

1. **Regular.** Students who have met all prerequisites and are fully accepted by the academic department as ready to proceed with a regular graduate program in that department are placed on **regular** status.
2. **Provisional.** Students who lack prerequisites, language or tool preparation, or who have low grade-point records are placed on **provisional** status. Notice of provisions to be fulfilled is sent to the student with the acceptance form. Fulfillment of provisions as

stipulated by the academic department automatically advances the student to regular status.

### Nondegree Status

Registration of students with baccalaureate degrees on a nondegree basis is permitted for teacher certification and for taking classes of personal interest to the student. All auditors must be formally admitted and registered.

Credit acquired at Brigham Young University while on a nondegree status or transfer credit from another accredited graduate school is not automatically a part of a degree program. Up to ten (10) semester hours of this credit may be included as part of a degree program if the student's advisory committee judges these hours to be acceptable.

### Continuous Registration

Details of the registration and records procedures are outlined in the class schedule issued each semester by the University Office of Admissions and Records.

When a student is admitted to a degree program, it is expected that he will work continuously and will register in that program until all requirements are completed. Normally a student will register each semester for a minimum of two semester hours of credit in work which is filed on his course outline as part of his approved graduate program. Each student must, in any case, meet the following minimum requirements:

1. Complete at least six semester hours of approved program credit during each academic year (September 1 to August 20)
2. Register for at least two semester hours of approved program credit during any semester or term in which University personnel are consulted or facilities are used

If a student is suspended for failure to meet the continuous registration requirement, no more than ten semester hours of credit previously acquired may be applied towards a new degree program if the student reapplies.

Every international student must register for a minimum of nine (9) hours each semester.

### Graduate Credit for Seniors

If, during the last semester of the senior year, a candidate for a baccalaureate degree finds it possible to complete all requirements for such a degree, he may register for graduate credit. A senior form provided by the Office of the Graduate Dean stating that all baccalaureate requirements are being met during the current semester must be signed by the appropriate undergraduate dean and presented to the dean of the Graduate School at the time of such registration. Normally, students requesting such permission will have previously applied for admission to a graduate degree program. Any who have not done so are urged to complete the application during that semester.

Three-year master's degree programs have been approved in accounting, physics, chemistry, and engineering. Under these programs, the departments are authorized to make a special arrangement in which a limited amount of graduate work is taken before the final semester of the senior year.

### Transfer and Nondegree Credit

Transfer credit (graduate credit only, from another accredited university) and/or nondegree credit acceptable to a student's advisory committee and not in excess of a total of ten semester hours may be applied toward a graduate degree at BYU. Forms for petitioning for such transfers (Form 3b) are available in the major department if the course outline is already on file in the Office of the Graduate Dean. All transferred credit must be of grade B or better. At least twenty semester hours toward the master's degree must be taken on the Provo campus in all programs except education and industrial education.

Transfer credit from foreign universities must be certified by examination. For further information see "Credits Certified by Special Examination," page 28.

Neither lower-division nor correspondence credit can be applied toward a graduate degree.

### Student Advisement

Every student accepted on a degree-seeking basis is assigned an academic sponsor (who is designated on the acceptance form). The student is expected to make immediate contact with his sponsor, stay in contact, and meet with the sponsor at least weekly during periods of regular enrollment. The sponsor's commission is to guide the student in his registration and individual study until such time as he is ready to proceed under the auspices of an advisory committee. This transition should take place during the first semester of registration.

The department chairman will appoint an advisory committee consisting of at least two persons for master's and educational-specialist committees and three for doctoral committees. Minor fields must be represented by a member of the advisory committee. The advisory committee is to direct the student through those experiences which will enable him to satisfy all requirements and examinations pertinent to his degree program.

### Student Programs

Immediately after the formation of the advisory committee and during the first semester of registration, the student should prepare and file his course outline (Form 3) in the Office of the Graduate Dean. This outline should reflect all prerequisites taken on provisional status, all tool subjects required, thesis credit, and all regular courses to be taken. This course outline must be completed under the direction of the advisory committee and signed by them.

When there is a needed change in the student's program or committee, the change must be requested on official forms provided by the Office of the Graduate Dean to each department (Form 3b) and be approved by the student's advisory committee and the department chairman or graduate coordinator. The forms must then be forwarded to the Office of the Graduate Dean.

As soon as possible after the formation of the advisory committee, the student should file an approved thesis or dissertation prospectus with the Office of the Graduate Dean. Project prospectuses are filed only when required by a department.

### Scholastic Standards

A grade-point average of 3.0 for all credit applying toward the degree is required of any student earning a degree in the Graduate School. **An incomplete is considered a failing grade.** No D credit can apply toward a graduate degree. A degree-seeking student (regular or provisional) whose grade-point average falls below 3.0 for a given semester shall be placed on academic probation. **Incompletes must be made up during the next succeeding semester to have probationary status removed.** In order to remove probationary status, a student must submit an unofficial transcript or grade change to the Office of the Graduate Dean.

### Suspension

Graduate students are suspended when there is no reasonable prospect of their being able to complete degree requirements. Suspension is automatic for all students who are on probation for two semesters or for one semester and one term. Suspended students may appeal for reinstatement under certain conditions.

### Oral Examinations

When the student's advisory committee has given approval of the substance of the thesis or dissertation, it



should be typed in the format approved by the department. If both the format and the content of the thesis are acceptable to the advisory committee, and if they judge the student to be prepared to pass the final oral examination, they will sign Form 6a recommending the examination.

The student should then take the signed Form 6a, together with three copies of the thesis or dissertation and a current unofficial BYU transcript, and deposit them with the department chairman. The department chairman (or graduate coordinator) will assign the oral examination committee, appoint its chairman, and set the time, place, and date of the examination. When the clearance and forms 9 and 10 are obtained from the Office of the Graduate Dean, the examination is officially scheduled.

Normally, two weeks must elapse between the date of the presentation of the thesis to the department chairman or graduate coordinator and the date of the oral examination. The student may petition the department chairman to have this time reduced if there are extenuating circumstances, but in no case may this period be less than one week.

Oral examinations may not be administered during any period in which the University is not in regular session.

### Submission of Theses and Dissertations

When the final oral examination has been completed and any changes required by the examination committee have been made, the thesis should be reproduced in final form. The binding fees and the microfilming fees for all doctoral and some master's programs should be paid at the Cashier's Office and the receipt submitted with four copies of the thesis or dissertation (five copies for CDFR) and one additional copy of the abstract (each properly signed) to the dissertation secretary in the Office of the Graduate Dean.

A brochure which states the policies and procedures governing theses and dissertations is available in the Office of the Graduate Dean. Great care should be used to meet the stipulations in this brochure to avoid the necessity of revising the final copies. The dissertation secretary will give advice and make preliminary checks on format upon request.

### Graduation

A student who contemplates graduation should secure from the Office of the Graduate Dean an Application for Graduation form and pay the graduation fee of \$20 at the Treasurer's Office. This should be done before submitting the thesis or dissertation to the Office of the Graduate Dean for approval as a basis for scheduling the final examination.

When the thesis or dissertation is approved by the dissertation secretary and all other requirements have been met, the student will be certified for graduation by the Office of the Graduate Dean.

All graduating students are encouraged to attend commencement and convocation exercises. Students not attending commencement must notify the Office of the Graduate Dean of the address to which their diploma should be sent.

### Credits Certified by Special Examination

Under certain circumstances graduate students who are working in degree programs at BYU may have the need to have certain of their credits certified by special examination. It is the policy of the Graduate School that students must pay for these examinations. Payment must be made in advance in an amount equivalent to ordinary registration fees for the amount of credit concerned. This arrangement applies specifically to the following situations:

1. Graduate credit taken at Brigham Young University, or another accredited university in the United States,

which has become outdated under the time limit regulations

2. Graduate credit which a student desires to transfer from a non-accredited institution or from a foreign university
3. Challenge of credit on the course outline for students who already have a good background in a required subject

Applications for these special examinations can be obtained in the Office of the Graduate Dean.

### Time Limits

Graduate credits are applicable toward a master's degree only within a five-year period from the time they are received.

All academic credit applicable toward the Educational Specialist Certificate, excluding credit applying toward a master's degree, must be completed within a period not to exceed six years.

All academic credit applying toward the doctor's degree, exclusive of that earned in completion of the master's degree, must be completed within a period not to exceed eight years.

All requirements for a degree must be complete by the day of August commencement in the year in which time limits expire.

### Student Load

Normal load for a student who is not working is twelve units per semester or six units per term. Graduate assistants must be registered for a minimum of six units per semester or three units per term.

### Graduate Awards

Further information concerning graduate awards is available through the Graduate Awards Office, B-336 ASB.

Teaching and research experience are seen as integral and indispensable parts of graduate student programs. For this reason, graduate awards given by Brigham Young University are in the form of teaching and research assistantships and internships. These awards are administered through the academic departments of the Graduate School and vary according to the requirements and opportunities of the different disciplines. The most remunerative of these awards totals \$3,400 per academic year. **Application for these awards should be made through the chairman of the academic department.**

Students receiving BYU awards must register during the regular registration period to claim their awards.

The three basic types of financial assistance available are:

**Internships.** Professional internships with outstanding professors ranging from one-fourth to one-half time are available in most departments. Students on this award must have and maintain a 3.5 grade point average. The type of experience provided varies widely according to the academic field.

**Assistantships.** Teaching and research assistantships are available in most departments.

**Supplementary Awards.** These grants may be used only for payment of fees and range up to \$320 per semester according to arrangements in particular departments.

### Student Loans and Financial Aids

Limited funds are available to help students remain in school when financial emergencies have arisen and personal or family resources are not available.

#### Short-Term Loans

Short-term loans are available for emergency assistance for tuition, books, fees, and other school expenses to full-time day students. These loans are made in small amounts

for immediate requirements. Repayment is required within the current semester.

### Church Student Loan Fund

The Church of Jesus Christ of Latter-day Saints makes aid available through a long-term loan program by which loans may be made to worthy full-time LDS students who are in critical financial need for tuition, books, fees, and other school expenses. Loans may be made each year in amounts usually not in excess of \$800 for graduate students. The student may be permitted to delay making repayment until after he discontinues his full-time status at BYU.

### Application

Information regarding student loans and application forms for loans are available from the Office of Student Financial Aid, A-41 ASB.

## Master's Degree

### Amount and Distribution of Credit

The master's degree requires a minimum of thirty semester hours of credit.

The master's thesis must carry a minimum of six hours, but no more than six hours of thesis credit may count toward the thirty-hour minimum. The thesis credit shall include such disciplines as review of the literature, all thesis research, and the writing of the thesis. Registration for thesis credit and work on the thesis must be concurrent.

A department, after authorization by the Graduate Council, may function under Option I and/or Option II. The following options for master's programs are available.

#### Option I

At least fifteen semester hours, exclusive of thesis, must be in the major field and at least nine semester hours in a minor field approved by the major department. The minor department must approve the specific courses which constitute the minor.

#### Option II

Thirty hours must be in the major field or in direct support of the major field. Under this option at least twelve hours must be in the major field of course work in a regular thirty- to thirty-two-hour program.

A graduate student may apply toward requirements for the master's degree a limited amount of credit earned by taking certain upper-division undergraduate courses at BYU which have been approved by the graduate advisory committee at the time of registration or appear on the course outline of a degree-seeking student. At least twenty hours of the credit for the master's degree must be in the 500 series or above.

A minimum grade-point average of 3.0 is required in all work applying toward the degree.

## Educational Specialist

### Admission Requirements

Students seeking admission to the educational specialist program must present evidence of a valid teaching credential, completion of at least two years of teaching or administrative experience, and a master's degree. The Graduate Record Examination (Aptitude and Advanced Test in Education) is prerequisite to admission as a regular degree-seeking student.

### Academic and Residence Requirements

The Educational Specialist requires 60 semester hours of work beyond the baccalaureate degree. Programs are

designed to meet the requirements of the Utah State Board of Education for state endorsements to the Professional Certificate. Twenty-four semester hours and three full-time registrations must be completed on the University campus. Advisory committees, appointed following the admission of the student to the program, will assist students in the preparation of a course of study.

## Doctor of Education Degree

### Admission Requirements

For admission to degree-seeking status as a doctoral applicant, the student must have completed twenty-two semester hours of education, or possess certification as a teacher, and must have completed two years of successful professional experience. Consult departmental announcements for specific requirements. Successful completion of a three-hour seminar is prerequisite to admission on regular status.

### Classification of Doctoral Students

Students seeking the Doctor of Education degree are classified as **degree applicants** and **degree candidates**. The student becomes a doctoral applicant upon recommendation by his department chairman or graduate coordinator. The department will normally require an examination or other screening procedure prior to this recommendation. The student is admitted to candidacy after meeting conditions for admission to candidacy and before registering for the dissertation and internship.

### Academic and Residence Requirements

The equivalent of a minimum of three years of full-time study beyond the bachelor's degree is required. Full-time study is defined as at least nine hours in course work or the equivalent in research per semester. The advisory committee has authority to decide what work will be accepted to meet these requirements. At least two consecutive semesters (or two consecutive full-time summer sessions with an intervening supervised field experience of 5 semester hours for each of two semesters for members of an organized group), during each of which a student is registered for not less than nine semester hours, must be taken on the Provo campus.

A minor must consist of at least twelve semester hours of approved credit.

### Tool Requirement

There is no foreign language requirement. The student must demonstrate proficiency in statistics to the satisfaction of the advisory committee.

### Admission to Candidacy

To be eligible for advancement to candidacy, the student must satisfactorily pass the final qualifying written examination and submit a dissertation prospectus approved by his doctoral advisory committee. The student has the responsibility for filing with the Office of the Graduate Dean Form No. 5, Request for Admission to Candidacy, when all conditions for candidacy have been met. Notice from the Office of the Graduate Dean then admits the student to candidacy for the degree.

### Project or Dissertation

A minimum of twelve hours of dissertation or project credit must be attained. An oral examination on the student's project or dissertation must be completed successfully by each candidate.



## Doctor of Philosophy Degree

### Classification of Doctoral Students

Students admitted to the Doctor of Philosophy degree program are classified as **degree applicants** and **degree candidates**. The student becomes a doctoral applicant upon recommendation by his department chairman or graduate coordinator. The department will normally require an examination or other screening procedure prior to this recommendation.

### Academic and Residence Requirements

A full semester of residence credit is defined as at least nine hours in course work or the equivalent in research per semester. The advisory committee has authority to decide what work will be accepted to meet these requirements. Ordinarily two years of full-time course work or research or its equivalent are to be taken on the Provo campus. At least two consecutive semesters of work, during each of which a student is registered for not less than nine semester hours, must be taken on the Provo campus. These two semesters are in addition to any residence completed in a master's program.

A minor must consist of at least twelve semester hours of approved credit.

The doctoral degree is awarded to a student when he has demonstrated his personal competence at an acceptable level in an appropriate field of endeavor. While successful passing of University course work contributes to the student's development of this competence, such activities alone do not assure him of reaching an appropriate level. Therefore, no minimum number of formal course credit hours can be identified as guaranteeing competence at the doctoral level.

Normally, a minimum of six semesters of full-time study beyond the baccalaureate degree or four semesters of full-time study beyond the master's degree is required for the Ph.D. or Ed.D. degrees. Attainment of skill in language or other tool subjects is independent of this minimum requirement.

The graduate student gains competence by means of many types of activity. Most of these involve services provided by the University, such as faculty time for guidance and evaluation, library resources, and office and laboratory spaces and facilities. It is therefore necessary that the student compensate the University for a part of this cost. While different programs involve various lengths of training, in no case will the doctorate degree be awarded until the student has paid to the University registration fees equivalent to six full-time semesters; or, if the student submits acceptable transfer graduate credit, registration fees will be reduced, but in all cases fees paid must be equivalent to a minimum of four semesters of full-time study.

### Tool Requirement

For academic areas in which a significant body of subject matter related to the pursuance of the Ph.D. degree is published in languages other than English, it is expected that doctoral candidates will include foreign languages as a necessary prerequisite to study in their respective fields. Where justified by the subject matter of the major area, however, a tool subject replacement for foreign language may be made.

In any case, the foreign language or the tool subject requirement should be considered a prerequisite to regular status as a degree-seeking student and is not to be considered as part of regular course work for accumulating credit hours in the major or minor fields of study.

Any of the four options below will satisfy the language-tool subject requirements. Departments specify which requirement or requirements are appropriate for their respective areas as approved by the Graduate Council.

#### Tool Requirement I: Single-Language

The student shall be required to demonstrate a thorough familiarity with French, German, Russian, or Spanish.

Fulfillment of this requirement will be manifest through examination that will demonstrate (1) the candidate's ability to translate literature in the field of specialization with a competent level of speed and accuracy and (2) the candidate's ability to communicate orally in the language with acceptable facility.

In lieu of a special examination that will demonstrate adequate use of the foreign language selected, this requirement can be met by the completion, with an average grade of B (3.0) or higher, of a minimum of twenty-two semester hours in the language. Students familiar with the language may be able to earn the first sixteen of the total twenty-two semester hours' credit by special examination, thereby qualifying them to register for the remainder of the credit from courses 321, 415, and 416, or their equivalent.

In either case, competency must be certified by the language department involved.

#### Tool Requirement II: Two-Language

Any one or a combination of the following provisions meets the two-language requirement. One of the languages must be French, German, Russian, or Spanish. The second language may be one recommended by the department and authorized by the Graduate Council.

1. Successful completion of ETS examination (given only in French, German, Russian, or Spanish). Dates of and application for these examinations are made with the BYU Testing Service, B-268 ASB.
2. Successful completion of the language course 95R in either or both acceptable languages (offered only in French, German, or Spanish).
3. Successful completion of sixteen semester hours of credit in the foreign languages that are approved by the major department and the Graduate Council for the degree program. An average grade of B (3.0) must be attained.

#### Tool Requirement III: One Language and One Tool Subject

This requirement may be met by including one of the languages in Option II plus eight to ten credit hours in any combination from the departments of Statistics, Computer Science, or Mathematics as approved for each department by the Graduate Council. Hours in mathematics would be beyond Math. III.

#### Tool Requirement IV: Single Tool Subject

This option would normally consist of an integrated program of eighteen to twenty-one semester hours of undergraduate studies in the departments of Mathematics, Statistics, and Computer Science in any combination, as approved for each department by the Graduate Council, showing systematic tool development. Hours in mathematics would be beyond Math. III.

### Comprehensive Examination

The student must pass a written comprehensive examination in his doctoral field under the direction of his major department. The minor department will be responsible for examining the student in the minor area. This examination will normally be given at the end of the second year of graduate study. Departments may also require an oral portion of the comprehensive examination.

### Admission to Candidacy

Satisfactory completion of the language requirement and the comprehensive examination, submission of the Application for Graduation form and payment of graduation fee, and submission of a dissertation prospectus approved by an advisory committee, are necessary for admission to candidacy for the Doctor of Philosophy degree.

The student has the responsibility of filing Form No. 5, Request for Admission to Candidacy, with the Office of the Graduate Dean when all conditions for admission to candidacy have been met. Notice by the dean of the

Graduate School then admits the student to candidacy for the degree.

### Dissertation

A minimum of eighteen hours of dissertation credit (799) must be attained. An oral examination on the dissertation must be completed successfully by each candidate.

## Instructions for Graduation Clearance

### Master's Degree Thesis Programs and All Doctoral Programs

1. Student must be registered for two hours of approved program credit or pay an equivalent continuous registration fee (fee accepted in lieu of current registration only upon written recommendation of the department).

Student applies for graduation and pays the \$20 graduation fee.

2. Student must have registered for all course work on the approved course outline before Form No. 6 is submitted. A cumulative GPA of at least 3.0 must be achieved. A student who is registered for course work during the last semester or term may schedule the final examination no earlier than two weeks into that semester or term.

3. Student obtains approval of thesis/dissertation from advisory committee. The committee signs Form No. 6a, signifying its judgment that the student is ready for the final oral examination.

**Special Note.** It is suggested that the student bring his thesis/dissertation to the thesis/dissertation secretary to review the format prior to making copies. At this time the student may receive helpful information from the thesis/dissertation secretary regarding printing.

4. Student submits Form No. 6a signed by advisory committee with the completed Form No. 6b, an unofficial transcript, a signed abstract, and at least three copies of the thesis/dissertation to the department chairman or graduate coordinator.

5. Department chairman assigns the final oral examination committee, appoints its chairman, sets the time and place of the examination, and distributes the copies of the thesis/dissertation. He adds the information concerning the oral examination to Form No. 6a and signs it.

6. Department chairman submits Form No. 6a, Form No. 6b, an unofficial BYU transcript, and one copy of the signed abstract to the Office of the Graduate Dean at least two weeks prior to the oral examination. He notes all uncleared problems and obtains the signature of the graduate dean. (If major problems are encountered that make it inadvisable to proceed with the examination, the graduate dean consults with the department chairman.)

7. Student conveys an approved copy of Form No. 6a, plus Forms No. 9 and No. 10, to the department chairman. Receipt of these forms is the signal that the final oral examination is official and may proceed.

8. After the final oral examination is given, the results are indicated on Forms No. 9 and No. 10. One copy of the completed Form No. 10 is sent to the Office of the Graduate Dean.

9. After all corrections are made, the binding receipt and four copies of the approved thesis/dissertation in its final form are left with the thesis/dissertation secretary in the Office of the Graduate Dean. The binding fee is paid at the Cashier's Office in the Smoot Administration Building.

10. When all steps are completed (including approval of the thesis/dissertation format and typing), the student is cleared for graduation; the letter of completion

is prepared, the degree is noted on the transcript, and the diploma is mailed.

### Master's Degree Nonthesis Programs

1. Student must be registered for two hours of approved program credit or pay an equivalent continuous registration fee (fee accepted in lieu of current registration only upon written recommendation of the department).

Student applies for graduation and pays the \$20 graduation fee.

2. Student must have registered for all course work on the approved course outline before Form No. 6 is submitted. A cumulative GPA of at least 3.0 must be achieved. A student who is registered for course work during the last semester or term may schedule the final examination no earlier than two weeks into that semester or term.

3. Student obtains approval from advisory committee that he is ready to schedule final orals or final written exam. The committee signs Form No. 6a, signifying its judgment that the student is ready for the final examination.

4. Student submits Form No. 6a signed by advisory committee with the completed Form No. 6b and an unofficial transcript to the department chairman or graduate coordinator.

5. Department chairman assigns the final oral examination committee, appoints its chairman, and sets the time and place of the examination. He adds the information concerning the oral examination to Form No. 6a and signs it.

6. Department chairman submits Form No. 6a, Form No. 6b, and an unofficial BYU transcript to the Office of the Graduate Dean at least two weeks prior to the oral or written examination. He notes all uncleared problems and obtains the signature of the graduate dean. (If major problems are encountered that make it inadvisable to proceed with the examination, the graduate dean consults with the department chairman.)

7. Student conveys an approved copy of Form No. 6a, plus Forms No. 9 and No. 10 (or No. 5b for written examinations), to the department chairman. Receipt of these forms is the signal that the final oral or written examination is official and may proceed.

8. After a final oral examination is given, the results are indicated on Forms No. 9 and No. 10. One copy of the completed Form No. 10 is sent to the Office of the Graduate Dean.

The results of the final written examination are indicated on Form No. 5b, which is signed by the chairman of the examining committee. The white copy is sent to the Office of the Graduate Dean.

9. When all steps are completed, the student is cleared for graduation; the letter of completion is prepared, the degree is noted on the transcript, and the diploma is mailed.

**Note:** See Graduate Degree Worksheet, pages 32-33.

## General University Services

### University Library

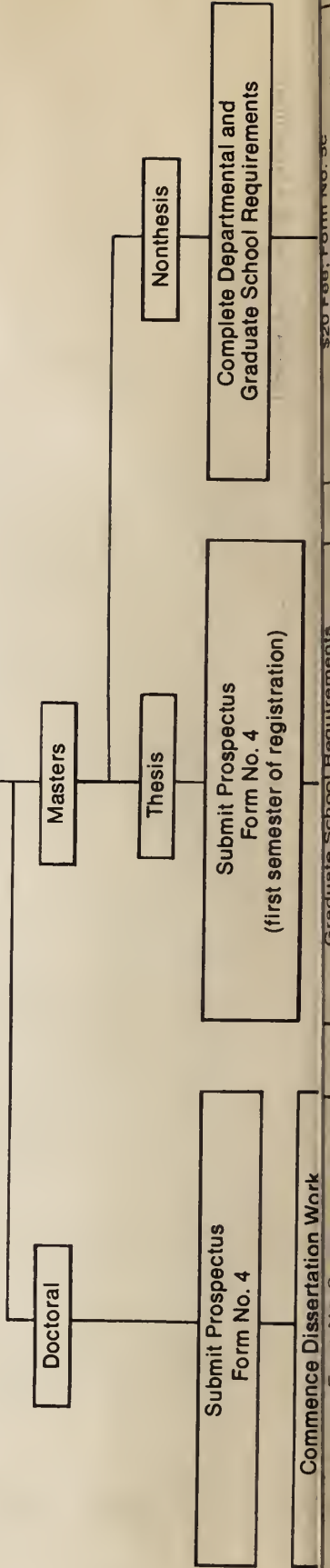
The Harold B. Lee Library contains the library collection, which includes over a million bound volumes and an extensive collection of pamphlets and titles on microform. Numerous professional journals and other current serials, as well as local, regional, and national newspapers, are also available. The library is a depository for United States, United Nations, Mexican, and Canadian government documents, and regularly receives publications of state and local governments.

The general library facilities are available to students, faculty, alumni, and other interested persons. Regularly



Graduate Degree Worksheet

Receive Letter of Acceptance
Return Intent to Register Card
Contact Sponsor (by mail or visit)
Preregistration (consult current class schedule)
Organize Advisory Committee (first semester of registration)
Submit Course Outline Form No. 3 (first semester of registration)
Make Necessary Changes in Course Outline Form No. 3b
Maintain 3.0 GPA Each Semester
Progress Report (receive computer printout from major department about 2 weeks after end of each semester)
Continuous Registration



Form No. 3

Graduate School Requirements

(before Form No. 6 is submitted)

Departmental Comprehensive  
Examinations; Form No. 5b

Application for Graduation;  
\$20 Fee; Form No. 5c  
(before last semester)

Admission to Candidacy  
Form No. 5  
(first week of last semester)

Complete Dissertation;  
Obtain Committee Approval

Application for Graduation;  
\$20 Fee; Form No. 5c  
(before Form No. 6 is submitted)

Complete Thesis; Obtain  
Committee Approval

Submit Thesis/Dissertation to Department  
Chairman with Forms No. 6a and No. 6b  
(about 7 weeks before graduation)

Final Oral Examination Scheduled by  
Department

Submit Forms No. 6a and No. 6b after  
Departmental Check  
(2 weeks before orals)

Complete Oral Examination  
(about 4 weeks before graduation)

Thesis/Dissertation  
1. Make Changes  
2. Print  
3. Microfilm (doctoral)  
4. Submit to Office of  
Graduate Dean for Binding  
(about 4 weeks before graduation)

Submit Form No. 6a to Department  
(about 6 weeks before graduation)

Final Oral/Written Examination  
Scheduled by Department

Submit Forms No. 6a and No. 6b  
after Departmental Check  
(2 weeks before orals)

Final Oral/Written Examination  
Forms No. 9 and No. 10 (oral)  
Form No. 5b (written)  
(about 3 weeks before graduation)



enrolled students present their identification cards to borrow books; others may obtain a permit from the circulation librarian. The library is open during the academic year from 7:00 a.m. to 11:00 p.m., Monday through Saturday.

The general collection and subject reference materials are available on open shelves on four of the five levels—two below and two above the ground floor. The general reference collection, the public catalog, the circulation desk, and administrative offices are located on the ground level. Study space is interspersed with stack areas on each floor. An information booklet is available at the general reference desk to assist those who use the library facilities.

The library's special collections, many of which are confined to specific subject areas, are located on the fourth level. Many of these fine collections are gifts to the library from individuals whose interests have led them to devote many years to the acquisition of fine books. The books and other materials from the special collections area are not available for general circulation, but may be checked out for use in a special reading room.

The facilities of other libraries operated by the LDS Church are also available to students of Brigham Young University. The Genealogical Society Library in Salt Lake City contains approximately 100,000 books and over 800,000 rolls of microfilm. These include family histories; genealogical records; biographies and autobiographies; military records; cemetery inscriptions; town, county, and state histories of the United States; and both local and national histories of other nations. The Utah Valley Branch Genealogical Library, operating under the general direction of the Genealogical Society, is headquartered at the Harold B. Lee Library.

Students and faculty may also use the facilities of other Utah college and university libraries through a cooperative arrangement instituted by the University and College Library Council of Utah. The BYU Library is a participating member of that council.

Facilities of the library of the Church Historian's Office are available by arrangement to advanced students for research. The office is located in the new LDS Church Office Building in Salt Lake City, and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. Its collections contain publications of the Church, periodicals of the various auxiliary organizations, reports and histories of the various missions, general Church historical records, biographies of Church leaders, and other pertinent published and archival material.

### Evening Classes

Regular graduate credit is given for evening classes. Day students may enroll in evening classes by indicating "Section 90" on their preregistration forms. Class schedules, listing classes and giving detailed information about all procedures, are available free of charge upon request.

Evening class registration should not be confused with official admission to the Graduate School. It is the student's responsibility to seek admission to the Graduate School. Evening class registration for community students may be completed by mail. Check the class schedule for complete information.

### Off-Campus Centers

The University has established several off-campus centers for continuing education:

BYU-California Center, 12550 Brookhurst Avenue, Suite D, Garden Grove, California 92640.

BYU-Ogden Center, 555-24th Street, Ogden, Utah 84401.

BYU-Ricks Center, 241 South 1st West, Rexburg, Idaho 83440, and 2630 North Yellowstone Highway, Idaho Falls, Idaho 83401.

BYU-Salt Lake Center, 401 12th Avenue, Salt Lake City, Utah 84103.

Additional classes are offered in other geographical areas, administered by the campus-based department of Off-Campus Lectures and Courses.

### Registration Requirements

Any individual with a baccalaureate degree may properly register for graduate classes. Not more than ten hours of credit may be accumulated at the centers prior to the time of admission to the BYU Graduate School.

### Application for Admission

A student desiring to enroll in a graduate program at BYU must take the initiative and be admitted to the Graduate School on a degree-seeking basis. Graduate application packets and letter forms are available at each center. Entrance examinations are also given periodically at the centers or may be taken at BYU in Provo.

### Computer Services

Computer Services provides extensive computing and card-processing (EAM) facilities to all faculty, staff, and students. In addition to equipment, extensive computer library programs and experienced personnel are available to help users with their particular problems. Academic users should contact the Assistant Director of Computer Services—Instructional, 403C ESTB, Ext. 3288. All users pay the costs of Computer Services operations according to approved funding-control procedures.

There are at present eight major computing centers on campus with about twenty computers of various sizes:

1. An IBM 360/65 installation in the Talmage Mathematical Sciences/Computer Building includes an IBM 360/65 with all basic input/output equipment, including remote terminals in the administrative and academic areas.
2. A PDP-10 time-share system, 425 ESTB, includes 50 remote terminals, 3 remote job entry stations and normal card input and printers output.
3. The Electrical Engineering Department has a NOVA 800, a CIP-2200, an HP-2100, and a PDP-11 in 425 ESTB to support electrical-engineering research and laboratory work.
4. An IBM 7030, in 142 ESC, includes card and tape input and printer and tape output. This installation also includes a PDP-15 with graphic terminal capability.
5. The Technology Center, 300 ESTB, includes a PDP-8/I with card and paper tape input, paper tape output, and six remote terminals. In 115 SNLB there is a PDP-8/I with one Tektronix graphic screen and sensor probes attached for on-line real-time control of cutting tools.
6. The Psychology Department has a PDP-8 in its experimental lab, 1303 SFLC, which controls on-line experiments.
7. The Computer Science Department has a PDP-11 in 237 TMCB for use by computer science students.
8. The Chemistry Department has a PDP-11 for experiment control and data acquisition and for preliminary data analysis.

EAM services include open-shop unit record machines in 156 TMCB; open-shop keypunch machines in 142, 145, and 199 TMCB, and 62 JKB; and closed-shop keypunch and data entry devices in 154 TMCB. Optical scanning equipment is available through Operations, 163 TMCB, and the Testing Department, B-268 ASB. Consulting services are available at 146 TMCB, 424-A ESTB, and 139 ESC. Hours are posted in each consulting room. Short "quickie" classes are conducted regularly in various basic computer subjects.

The Computer Services **User's Guide** is available in the BYU Bookstore.

### Statistical Services

Statistical Services is a cooperative effort among Computer Services and the departments of Statistics and

Mathematics and is designed to assist with those phases of research projects that require statistical design and analysis, numerical analyses, or special computational techniques.

All research can be more productive if the initial planning includes adequate attention to the proper design of the experiment or survey and the choice of an appropriate sample size. Proper execution of these two steps significantly improves the chances of the research goals being met. In addition, appropriate analyses and interpretation of the experimental results are vital to well-executed research projects. Statistical Services provides assistance in all of these areas. To obtain maximum benefit this service should be used in the formative stages of research projects, since the validity of final inferences is greatly dependent upon the experimental or sampling design.

These services are available by appointment through the Department of Statistics, 204 TMCB.

## Placement Center

The Placement Center, located in the Abraham O. Smoot Administration and General Services Building, assists graduating students and alumni in finding desirable positions in their fields in business, industry, government, and education. This office works in close cooperation with deans and department chairmen.

The placement service includes a placement library where interested students may find books, articles, magazines, and brochures that will acquaint them with employers in whom they may be interested and also books and pamphlets that contain advice on such matters as how to conduct oneself in an interview, how to write effective letters of application, how to find employment, etc.

All students are urged to register with the Placement Center early in the school year in which they will complete requirements for a degree. Early registration will enable that office to give the most effective possible assistance to each graduate seeking employment.

## Student Employment

In the Employment Office assistance is given to needy students in finding part-time employment. This includes help not only in placing students in positions on the University campus, but also in finding part-time employment off campus.

In order that students may adequately pursue their academic work, it is suggested that they devote as much time as possible to their studies and not attempt to work also. When a student must work in order to supplement his college funds, he should be aware that there is a maximum limit of twenty hours per week that he may work on campus.

Students needing employment are urged to register with the Employment Office as soon as possible after they arrive in Provo and are available for work. Need weighs most heavily in deciding who shall receive leads for jobs, but hours available and required skills are also important considerations. The best schedule for which part-time work can be arranged is one where the free hours (a block of three to four hours) are in consecutive order at the same time each day. Inasmuch as the number of students seeking part-time work is very high, those whose need is great are requested to report periodically at the Employment Office after filing initial application.

Students from foreign countries are required to obtain a work permit before they may take employment. Such students may receive assistance in obtaining the necessary permit from the international student adviser.

## Security and Traffic

The Security/Police is a protective agency established for the benefit of students, faculty, and staff. It maintains effective liaison with the local police department and is

entrusted with the proper enforcement of campus rules and regulations. All matters concerning security or requiring police action should be referred to this office by calling Ext. 2751.

Another major responsibility of this office is the control of campus traffic and parking. Every BYU student who owns, maintains, possesses, stores, or drives any motor vehicle in or about the State of Utah or intends to drive any such vehicle on the BYU campus must register that vehicle with the Security Office within two (2) days after bringing it to the Provo area.

The Security/Police offers many other services to students and staff members, including the taking of fingerprints necessary for teaching certificates, government jobs, and ROTC between the hours of 10:00 a.m. and 12:00 noon Monday through Friday. In addition, an ambulance service is maintained in cooperation with the student health center, at no cost.

### Automobile Registration

To obtain a parking or registration permit, the following must be presented at the Traffic Office, B-69 ASB:

1. The appropriate fee (no fee for registration only)
2. The name of insurance company with which the automobile is insured
3. Proof of no-fault insurance (automobiles)
4. Proof of liability insurance (motorcycles)

### Traffic Regulations

Every student who is a resident of Utah or of a state other than these listed below must have a Utah license if he wishes to drive in Utah. The following states have entered into a compact and a license from any of them is good in all others:

Alabama	Indiana	New Mexico
Arizona	Iowa	New York
Arkansas	Kansas	Oklahoma
California	Louisiana	Oregon
Colorado	Maine	Tennessee
Delaware	Mississippi	Utah
Florida	Montana	Virginia
Hawaii	Nebraska	Washington
Idaho	Nevada	West Virginia
Illinois	New Jersey	

For further details regarding traffic rules and regulations, a Traffic Rules and Regulations Booklet may be obtained at no charge from the Traffic Office located in the Abraham O. Smoot Administration and General Services Building, B-69, extension 3906. All students, faculty, and staff members will be responsible for the information contained therein.

Brigham Young University maintains a zoned parking system. Upper class permits—for juniors, seniors, and graduate students—are \$12. Lower-class permits—available to all students—are \$6. The required registration is free but allows no campus parking until after 4:00 p.m.

### Nonresident

Students from out of state who do not have Utah license plates on their cars may obtain a nonresident permit for their vehicles as long as their main purpose for being in Provo is education. Full-time employees of the University or students whose wives are full-time employees do not qualify; they must purchase Utah plates and pay Utah property taxes on their vehicles. Either a nonresident permit or Utah license plates must be obtained immediately upon registration at the University. To obtain a nonresident permit the student must present the following at the Information Booth located across the street from Helaman Halls or about 200 East 1230 North:

1. Home-state vehicle registration certificate
2. Proof of current safety inspection from Utah or home state
3. Fifty cents
4. BYU activity card



Lyceums and Forums

Almost since its founding Brigham Young University has been bringing to its students distinguished men and women in the arts and letters. The lyceums, usually evening programs, are of cultural value. Forum assemblies feature speakers and artists who can offer students a better understanding of contemporary civilization.

University Fees

The University reserves the right to change these figures without notice.

All students who register will be expected to pay tuition and fees prior to or at the time of registration. **Students are held responsible to pay the correct tuition and fees.**

Approximately 70 percent of the cost of operating the University is paid from the tithes of the LDS Church. Therefore, students who are active Church members, or their families, already have made a monetary contribution to the operation of the University. To equalize this burden somewhat it is necessary to charge nonmembers a higher tuition. This disparity is similar to the higher tuition that state universities charge to nonresident students. Even the higher total payment, however, does not cover the total educational cost of nonmembers of the Church.

A fraction of an hour is, for fee assessment purposes, counted as a full credit hour.

The charge for noncredit courses or for auditing courses is the same as for credit courses. Noncredit courses taken by part-time students will be assessed on the basis of hours involved in lecture classes. For example, three hours of lecture a week would be considered three semester hours and would be charged for accordingly. Therefore, if a student were taking seven credit hours plus a noncredit class involving two or more lecture hours per week, he would be considered a full-time student and must register as a full-time student. For courses in which no lecture hours are involved—for example, dissertations and theses—tuition and fees will be charged based on hours being carried during the semester, as determined by the supervising professor.

All graduate students who are not regularly registered but continue to use University services or facilities (including consultation with a major professor) will pay the minimum tuition equivalent to two semester hours during each semester in which University services or facilities are used.

Advanced-standing Students

With the exception of students enrolled in the Law School and in MBA, MPA, and M.Acc. programs, all students at the University who have completed 128 semester hours or more of credit prior to the term or semester for which they are registering will be designated as advanced-standing students. Among those who have advanced standing are students completing their first or second bachelor's degree, those taking classes while fulfilling a change in academic majors, graduate nondegree students, and graduate degree-seeking students.

Students in this category should be aware of the non-refundable overload fee for registrations of over 16 hours per semester or over 8 hours per term. Because a subsequent reduction of course load will not relieve the overload assessment, advanced-standing students should register for exactly the classes they need.

Admission Application Fee

A \$15 nonrefundable application fee must accompany the admissions application, both to be submitted by specified deadline dates.

Late Registration Fee—Semester

A late registration fee is assessed all full-time and part-time students for failure to complete registration on scheduled dates. No exception is made, regardless of the reason for being late.

Any student whose check is dishonored by his bank will be charged a handling fee of \$5. If the check was for tuition, there will be an additional charge of the late fee in effect at the time the check is redeemed.

Refunds—Semester

In the event of withdrawal by a student, a refund will be made on the basis of a charge of \$10 (\$5 for a part-time student) even though the student does not complete registration or attend school, plus a per-day charge of 3 percent of the total tuition and fees paid or payable for the semester. The days charged for will be the school days beginning with the first day of the semester in which classes were held following the date on which the student registered, to the day on which the student reported his withdrawal to the Office of the Graduate Dean, both days inclusive.

Late fees are not refundable.

Tuition and General Fees

	Per Semester (Fall or Winter)		Per Term (Spring or Summer)	
	LDS Member	Nonmember	LDS Member	Nonmember
Law School Students .....	\$550.00	\$825.00		
MBA, MPA, and Master of Accountancy Students:				
Full-time				
Semester (over 8 credit hours) .....	420.00	630.00		
Term (over 4 credit hours) .....			\$210.00	\$315.00
Part-time .....	45.00	67.00	45.00	67.00
	per hour	per hour	per hour	per hour
Advanced-standing Students:				
Full-time				
Semester (over 8 credit hours) .....	*360.00	*540.00		
Term (over 4 credit hours) .....			*180.00	*270.00
Part-time .....	38.00	57.00	38.00	57.00
	per hour	per hour	per hour	per hour
*Nonrefundable Overload Fee .....	15.00	15.00	15.00	15.00
	per hour	per hour	per hour	per hour
	over	over	over	over
	16 hours	16 hours	8 hours	8 hours

Any refund due a student because of withdrawal from school will be made only by check, through the mail, approximately three weeks from the date on which the student reported his withdrawal and surrendered his receipt or activity card to the Office of the Graduate Dean.

No refund will be granted to a student who is requested to withdraw for scholarship or other causes.

No refund will be made after August 31 of the school year in which payment was received by the University.

### Class Fees

Education 578R, 673R (2 credit hours) .....	\$15.00
Education 578R, 673R (4 credit hours) .....	25.00
These education fees are to be paid at the time of application for student teaching. An additional \$10 late fee is assessed if application is completed after March 31 for Fall Semester and October 15 for Winter Semester. The \$10 late fee is not refundable under any circumstances.	
Music 660R (45-minute lessons) .....	95.00
Recreation Education 502R .....	10.00

### Miscellaneous General Fees and Fines

<b>Activity cards</b>	
Duplicate card fee .....	\$ 4.00
Identification photo .....	2.00
Spouse activity card per semester (non-refundable) .....	5.00
<b>Automobile and motorcycle registration and parking fee:*</b>	
<b>Zone B</b>	
Fall and Winter semesters .....	12.00
Winter Semester only .....	6.00
Spring and Summer terms .....	6.00
Summer Term only .....	3.00
<b>Zones C and D</b>	
Fall and Winter semesters .....	6.00
Winter Semester only .....	3.00
Spring and Summer terms .....	3.00
Summer Term only .....	1.50
*Registration is mandatory and no fee is charged if student elects NOT to park on campus.	
Bicycle registration (Provo City License) .....	3.00
Change of grade fee (unless the change is the responsibility of the University) .....	3.00
Change of registration fee (for each change slip presented after the first two weeks of each semester) .....	5.00
<b>Deposits</b>	
Chemistry (each laboratory class) .....	10.00
Industrial education .....	1.00
Physical education locker fee (nonrefundable) .....	1.00
Examination, repeat foreign language for advanced degree .....	10.00
<b>Graduate Special Examination</b>	
To update credit and/or transfer credit from a nonaccredited institution or from a foreign university whose academic standards are not known to the faculty at BYU. (See page 28, "Credits Certified by Special Examination.")	
Graduate student continuous registration fee (for graduate students using University facilities without formal registration for University classes) per semester .....	2-hour rate
Graduation fee, master's or doctor's degree (only 50 percent refunded if degree is not obtained) .....	20.00
<b>Incomplete grades</b>	
A student must complete an incomplete course within one year of the date the in-	

complete grade was given. Fee to remove incomplete grade and record permanent grade .....	3.00
<b>Locker rental (McKay Building and Eyring Science Center)</b>	
1 semester .....	1.50
2 semesters .....	2.50
2 semesters and 2 terms .....	3.00
Key deposit .....	1.00
Replacement of lost key .....	1.00
Music recital fee (solo or joint recital) .....	35.00
Parking violation fines .....	2.00 to 15.00
<b>Records</b>	
Hold fee (to release holds placed on records because of financial delinquency) .....	2.00
Search fee (duplicate receipt) .....	1.00
Transcript fee (\$1.00 for first copy on every order, plus \$.50 for each additional copy) .....	1.00
Thesis binding (4 copies) .....	18.00
Traffic violation fines .....	Variable, according to violation

## Student Personnel Services

The Student Personnel Services offer valuable assistance in the following areas that affect graduate students: academic standards, counseling service, foreign students advisement, health services, student organizations and social life.

### Dean of Student Life

The dean of student life is the chief administrative officer of Student Personnel Services. He initiates and recommends to the President needed policies and procedures in student life, and administers the program and coordinates the agencies at work on student problems.

### Personal Development Center

The overall purpose of the Personal Development Center is to promote the personal growth of individuals within society and within the University community. To reach as many students as possible, the Personal Development Center extends itself beyond the confines of the center by locating counselors in a number of areas on campus. The services provided to students include (1) counseling, (2) skills development, (3) testing, and (4) information.

### Counseling

A great number of students seek counseling each year for a variety of reasons. In general, they come to the center for reasons of growth or decision making. Specifically, students come for help in such areas as making vocational choices or choosing majors, dealing with study problems, developing social and interpersonal skills, growing in greater self-understanding, and working through personal problems. Some students find that individual counseling on a one-to-one basis with a counselor offers greater assistance, while others may benefit more in a group counseling situation, where several students and a counselor meet together. In both individual and group counseling, the primary focus is not upon the student's deficits or upon long-term therapy—although the latter is not neglected; rather, it is upon assisting the student to grow, mature, and accept full responsibility for his actions.

### Skills Development

In addition, the Personal Development Center provides a program to assist students in developing academic, social, and interpersonal skills to help them cope more effectively with college life and other situations. Students may participate in one or more of a variety of learning programs, where they may be taught the skills they wish to improve. Such a program may be individually worked out for each student through the help of a counselor.



### Testing Services

Tests for achievement, ability, interest, and adjustment are given to all students who request them through a counselor. Data from these tests are used as a basis for counseling in educational-occupational and personal-social problems.

### Informational Services

A comprehensive, current collection of essential occupational, educational, personal, and social information is maintained in the Personal Development Center library. In addition to many occupational monographs, briefs, and current catalogs of major universities and technical schools, there is an abundance of materials available relating to personal and social adjustment, including such areas as personality development, dating, marriage, budgeting, personal grooming, and college adjustment.

### International Student Advisement

International students include all students who have F-1, J-1, or immigrant or permanent resident visas, even if the holder is currently residing in the United States. All correspondence regarding admissions and other matters should be addressed to the Admissions Office (A-153 ASB).

While on the BYU campus, international students should keep in close contact with the International Student Office and take advantage of the services offered by the staff of this office.

### Student Health Service

Student health services are available at the Howard S. McDonald Health Center for all full-time students carrying 8½ credit hours or more, who have a valid activity card. The center functions year-round, with regular clinic hours, by appointment, from 8:30 a.m. to 4:30 p.m., Monday through Friday. After 4:30 p.m. daily and on Saturday, Sunday and holidays, the center is open to urgent care and there is an extra fee charged for seeing a physician during these times. Hospitalization, when necessary, is available at the Utah Valley LDS Hospital.

The health center offers the following services at a reasonable rate:

1. Consultation with a nurse-practitioner, general physician, or specialist—by appointment—between 8:30 a.m. and 4:30 p.m. weekdays
2. Immunization
3. Pharmacy
4. Physical therapy on referral from a physician
5. Laboratory tests
6. X-ray examination
7. Emergency care twenty-four hours a day

A doctor will be summoned after hours for emergencies on a fee-for-service basis. Services not available at the health center are available by referral at outside facilities.

A student may elect to prepay for his care at the health center by joining the Student Health Plan, which entitles the student to the services of the health center without additional cost. For more information on the Student Health Plan, see the health center brochure.

To complement the services of the student health center, a supplemental insurance program, designed to cover the major cost of medical care twenty-four hours a day, is offered to all full-time students at a nominal cost. This voluntary program is fully endorsed by the University and provides for a wide range of medical services. Students not otherwise protected by health insurance are urged to secure this excellent service. For further information, insurance brochures are available at the health center.

Eligible students are not required to have insurance or to participate in the health plan to use the student health center.

The health center is bound by the laws of confidentiality, and personal information will not be released to a third party without written permission from the patient.

### The BYU Code of Honor

The Church of Jesus Christ of Latter-day Saints sponsors Brigham Young University in order to provide students with a university education in an atmosphere consistent with the ideals and principles of the Church. The maintenance of high standards of personal behavior and appearance is essential to the preservation of that atmosphere and also to the development of men and women who personify those ideals and principles. By enrolling or accepting employment at Brigham Young University a person signifies his willingness to live in accordance with the following principles, whether on or off campus:

1. Abide by the standards of Christian living taught by The Church of Jesus Christ of Latter-day Saints.  
This includes graciousness and consideration for others and the observance of high principles of honor, integrity, and morality.
2. Be honest in all behavior.  
This includes not cheating, plagiarizing, or knowingly giving false information.
3. Respect personal rights.  
This includes—  
(a) not physically or verbally abusing any person and not engaging in conduct which threatens or endangers the health or safety of others.  
(b) not obstructing or disrupting the study of others, the performance of official duties by University officers or employees, the teaching, research, disciplinary, administrative, or other functions of the University, or other authorized activities on University premises.
4. Respect property rights.  
This includes refraining from theft, concealment, damage, or misuse of the property of others.
5. Obey, honor, and sustain the law.
6. Avoid drug abuse.  
This includes refraining from the possession, use, or distribution of any narcotic or dangerous drug (as defined by applicable law), except as prescribed by a licensed medical practitioner.
7. Comply with all University regulations.  
This includes compliance with rules relating to campus organizations and to the use of University or off-campus housing or other facilities.
8. Observe the Word of Wisdom.  
This includes abstinence from alcoholic beverages, tobacco, tea, and coffee.
9. Live the law of chastity.  
This includes abstinence from all sexual relations outside the bonds of marriage.
10. Observe high standards of taste and decency.  
This includes refraining from disorderly, lewd, indecent, or obscene conduct or expression.
11. Observe University standards of dress and grooming.
12. Help others fulfill their responsibilities under this Code.

### Veterans Service

All veterans should have their military experience evaluated for credit by the Office of Admissions and Records.

For information concerning educational benefits available to those who qualify under the Veterans' Readjustment Benefit Act, please contact the Veterans' Affairs and Selective Service Office, B-234 ASB, or call Ext. 3433. Forms for certification may be secured and processed to assure proper payment of benefits.

### War Orphans Education Program

Students who are dependents of veterans under the War Orphan Education Program, and who are entitled to benefits, should also contact the above office for enrollment certifications and related information.

### Religious Opportunities

Students have many excellent opportunities to participate in religious activities, which have always been an integral

part of the educational program at Brigham Young University.

### BYU Stakes

The Church is organized into a number of stakes, and each stake is composed of several branches of 200 and 300 members each. The stakes and branches are organized specifically to provide students the maximum opportunity for active participation in programs of the Church. Spiritual growth and the development of a strong testimony of the divinity of Jesus Christ are goals fostered by the campus stake and branch organizations, whose programs are closely correlated at all levels with the activities of the University.

All single LDS students living away from home become members in one of the BYU branches. Married students not living in University housing may attend either the BYU branch or the city ward in which they reside. The membership records of students remain in the BYU stakes until they finish their schooling at the University.

### Devotional Assemblies

Devotional assemblies are held on Tuesday mornings and are scheduled so that there is no conflict with classroom work. These assemblies enable students to hear messages of inspirational power from carefully chosen Church leaders, including many General Authorities of The Church of Jesus Christ of Latter-day Saints.

## Student Housing

Learning to live harmoniously with other people under the right kind of living conditions plays a vital part in a college education. Students living in groups, working, studying, and enjoying recreation together, gain much from each other. The conversations, good fellowship, and activities experienced in group living contribute to a person's whole development. Participation in democratic, self-governing living activities brings about a phase of education which can be gained in no other way.

The Office of Student Housing, established to assist students with their housing needs, is located in the Abraham O. Smoot Administration and General Services Building, Room C-169. All inquiries or administrative problems relating to housing needs should be referred to this office.

### Campus Housing

#### Residence-Hall Supervision

Each area of campus housing is organized under the supervision of a person with professional training and experience for this type of work. The residence-hall staff carries out a program designed to provide each student with experiences in democratic self-government, in cultivating the responsibilities that go with maturity and independence, and in learning the art and science of human relationships in working and living with others. The staff assists the student to achieve a sense of belonging and to develop social competence through planned social and recreational programs. Head residents are available for general counseling. They carry out the residence-hall program in cooperation with other University academic services.

#### Applications

A student who plans to enroll at the University and live in a University residence hall should make inquiry to the Office of Student Housing about a year in advance. A housing application form will be sent to each inquiring student. A \$10 application fee is required and should be enclosed with the completed application form when it is returned to the Office of Student Housing. A residence-hall assignment and appropriate agreement forms are prepared on a basis of the date of receipt of the application form by the housing office and are mailed in the spring and early summer.

### Acceptance to University Housing

The validating of any campus housing reservation is contingent upon the student's official acceptance and admission to the University. For admission to the University contact the Graduate Admissions Office, D-251 ASB.

### Rental Agreements

A student planning to live in campus housing may expect to sign a rental agreement for the accommodations he will occupy. He should be prepared to live by the terms of this agreement once he has signed and returned it to the Office of Student Housing. Misunderstanding and financial loss can be avoided by a student if he will read and familiarize himself with the terms of the agreement before signing it.

### Apartment Living for Women

Housing for women is provided in twenty-four Heritage Halls. These are apartment-type buildings. Each apartment consists of a combination kitchen-dining-study room arrangement, three bedrooms, and a bath. In addition, there are large living rooms, a recreation room, a head resident apartment, and laundry and storage facilities in each building. Six girls occupy an apartment and live cooperatively, preparing their own meals. The apartments are completely furnished except for bedding, kitchen utensils, and dishes. The facilities are excellent and offer a high standard of living for college students. The approximate annual rate for these accommodations is \$405. Food is purchased cooperatively by the residents of each apartment.

Help in the homemaking experiences of budgeting, buying, meal planning, and the selection, care, and construction of clothing is available from specialists who are assigned to Heritage Halls. In addition, a specialist is available to assist students in planning social activities, developing recreational skills, and learning wise use of leisure time.

Each woman student desiring to live on campus should consider carefully the type of accommodations desired in view of her economic needs, time available for activities within her housing situation, and type of experience desired. Agreements are made for the academic year, and moving from one type of accommodation to another during the year is difficult to arrange.

### Residence Halls

Board and room services for men and women are provided in eight buildings known as Helaman Halls and six buildings in Deseret Towers. These buildings form a beautifully designed residence-hall development. The buildings are conveniently grouped around an attractively planned and developed central building. Each residence hall accommodates 234 to 264 students, with two persons sharing each bedroom. In addition, living rooms, study rooms, central shower areas, recreational rooms, adequate laundry and storage facilities, and a head resident apartment are located in each building. These halls provide some of the best student living experiences offered on any university campus. The central building features spacious dining rooms and a snack bar, providing the excellent food service for which BYU is noted. This building also contains beautiful living rooms, recreational areas, administrative offices, and other management facilities such as mail rooms and laundry and dry cleaning pickup stations. The approximate annual rate for these accommodations is \$995. A few single rooms are available at an approximate rate of \$1066.

### Apartments and Homes for Married Students

Family accommodations for 612 married couples and their children are provided in housing developments known as Wymount Terrace and Wyview Park. All units in married-students' housing are assigned according to family size.

Wymount Terrace—which includes 24 residence buildings, an administration building, and 3 laundries—consists of 462 apartments. There are 108 one-bedroom units, 60 one-bedroom-study units, 264 two-bedroom units, and 30 three-bedroom units. The monthly rental rates are approximately \$82 for the one-bedroom units, \$88 for the one-bedroom-study units, \$92 for the two-bedroom units,



and \$102 for the three-bedroom units. In addition, each family pays for its electricity. Balconies or porches for all apartments open on courtyards. Apartments have an all-tile bathroom, a kitchen with modern appliances, including garbage disposal units, gas ranges, electric refrigerators, and an attractively designed living room.

Wyview Park—which consists of 150 mobile homes and a central building—will accommodate 150 married couples and their children. There are 36 one-bedroom units, 78 two-bedroom units, and 36 three-bedroom units. These units are rented on the same basis as Wymount Terrace with the same monthly rates as corresponding units in that area. All mobile homes are unfurnished with the exception of refrigerators and stoves.

The Residential Housing Department can assist those who desire to live off campus in finding suitable apartments in the Provo community.

### Residential Housing

All students living off campus are required to live in University-approved housing. The Residential Housing Department of the Office of Student Housing maintains up-to-date listings of approved residences. This office is established to assist students upon their arrival in Provo to find suitable quarters if they desire to reside in the community.

Residential housing consists of apartments, rooms with kitchen privileges, board-and-room residences, and sleeping rooms located in homes in the community. These facilities are inspected by University representatives to see that they comply with established standards before they are approved for student occupancy. Through the cooperative efforts of landlords and the University, constructive action has been taken to raise the standard of student housing throughout the community. Before making any commitments for residential housing, students should be sure that the place in which they contemplate living has been approved by the University.

A student planning to reside in the community should expect to sign a rental agreement form. He should be prepared to live by the terms of this agreement once it has been signed, and a copy should be returned to the Office of Student Housing. Misunderstanding and finan-

cial loss can be avoided if the student will read and familiarize himself with the terms of the rental agreement form before signing it.

### Rates

Rates for residential housing accommodations vary with the type of service provided; consequently, only a general indication can be given here. Sleeping rooms rent from \$30 to \$45 per month. Apartment accommodations run from \$40 to \$70 per month per student. Board and room is available at the rate of \$70 to \$90 per month. Apartments for married students can be obtained at a rate of approximately \$85 to \$175 per month.

### Time of Arrival

Residence halls are not open to a student prior to the announced opening date, usually the day before freshman orientation. The University does not advise a student who is going to live in campus housing to arrive before that date.

### Food Service

As a convenience to students and faculty members, the University provides food services at very reasonable prices through several different operations: cafeterias, snack bars, vending machines, concessions, catering, a dairy products outlet, and a bakery.

Residence hall cafeterias located at Deseret Towers and Helaman Halls provide regular meal service for both residents and students living off campus who purchase meal tickets. Another cafeteria is located in the Wilkinson Center, where meals may be purchased with cash or with reduced-rate scrip books. Excellent food at slightly higher prices is available in the Skyroom on the sixth floor of the Wilkinson Center.

Snack bars are located at Deseret Towers, Helaman Halls, and the Wilkinson Center, providing food service throughout the day. Vending machines are located at various places on campus.

In addition, the University operates a dairy products laboratory where milk, ice cream, cheese, and other products may be obtained. This facility is also an outlet for products from the bakery.

# List of Courses

## General

Students should consult the class schedule for specific information concerning semesters or terms in which classes are offered, except as specially noted.

### Semester System

Courses of study at Brigham Young University are offered and credit for satisfactory completion is granted on a semester basis.

### Course Numbering System

Course Number	Type of Course
500 to 599	Graduate courses open also to advanced undergraduate students
600 to 799	Graduate students only

### Credit-Hour Designation

The three-number code which appears in parentheses immediately after each course title has the following significance:

First number:	Semester hours of credit
Second number:	Class hours of lecture, recitation, or seminar meeting per week or— Minimum hours of individual study required per week
Third number:	Laboratory hours required per week or— Hours of field study or individual research per week

### Abbreviations and Symbols

The following abbreviations and symbols are used in the List of Courses section:

- Arr. Class or laboratory hours to be arranged
- ea. Credit-hour designation applies to each course number listed
- ☐ Course originating in one department which may count for credit in another department
- R Course which may be repeated for credit

### Cross-referencing of Courses

Each course is listed completely only once in the catalog. If the course may count in another department, it is listed in abbreviated form in that department and is preceded by a special symbol, ☐.

### Graduate Courses

No D credit can apply toward a graduate degree. Neither lower-division nor correspondence credit can be applied toward a graduate degree.

## Reservation of Right to Change Courses

The University makes every effort to ensure the accuracy of the contents of this catalog but reserves the right to eliminate, discontinue, or add courses at any time.

## Accounting

**Professors.** H. Andersen, Hubbard, Johnson, Knighton, Orton, F. Skousen, K. Skousen, J. Smith, R. Smith, Taylor (graduate coordinator, 348 JKB), Woodfield (chairman, 350 JKB).

**Associate Professors.** Cameron, Garrison, McAllister, Western.

**Assistant Professors.** L. Anderson, Hardy, McKell, Randall.

**Programs.** Master of Accountancy (M.Acc.), M.Acc./J.D.

**Entrance Examination Required.** Admission Test for Graduate Study in Business (ATGSB), applications available from Educational Testing Service, Box 966, Princeton, New Jersey 08540, the BYU Testing Office (B-238 ASB), and most universities.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Fall only, except those in advanced standing.

## Master of Accountancy

**Prerequisites.** Students enter this program after completion of their undergraduate junior year. The following courses or their equivalents must have been taken prior to entering the program. Those who have not completed these prerequisites are urged to register in the College of Business as undergraduate students.

### Premajor

Acctg. 201, 203, 232A, B, 342  
Econ. 110  
Comput. Sci. 133A, B  
Math. 110  
Stat. 221

### Preprofessional

Acctg. 301, 302, 312, 321  
Econ. 300, 301  
Bus. Mgt. 301, 341  
Bus. Ed. 320  
Org. Behav. 321



**Transfer Students.** Students who have completed a bachelor's degree in accounting from an accredited university may be admitted on a special advanced standing basis if some of the required and most of the prerequisite courses have been completed. Within a minimum period of ten months it may be possible to complete the requirements for the M.Acc. degree. The time period required will depend upon the particular courses the student has previously completed. In any case, the program should terminate with a spring or summer term.

**Foreign Students.** Students whose native language is not English are required to take at an American university at least 12 semester hours in accounting subjects, including intermediate accounting, before they can be considered for admission.

**Minor Permissible.** Option I (approval of graduate accounting coordinator), or Option II (supporting fields).

**Requirements.** Minimum of 32 semester hours beyond the hours required for a bachelor's degree, written comprehensive examination; special emphasis is given to written and oral communication, internship experience, and preparation for professional examinations such as the CPA or CMA. All students will be urged, although not required, to participate for at least one semester as a graduate assistant. Contact the graduate coordinator for details of this program.

#### Required Courses.

Fall: Acctg. 332, 356, 412, 465, 691R (1); Electives (3).  
Winter: Internship

Sp/Su: Acctg. 401, 402, 421, 687R (1); Rel. (2); Electives (6)

Fall: Acctg. 475, 687R (1); Org. Behav. 610; Bus. Mgt. 638A; Electives (3)

Winter: Acctg. 442, 612, 632, 687R (1); Electives (3)

Spring: Acctg. 613, 687R (1); Bus. Mgt. 639A

#### Master of Accountancy/Juris Doctorate

A special law (Juris Doctorate) and M.Acc. program combination can be arranged for certain qualified students who are successful in being admitted to both the J. Reuben Clark Law School and the BYU College of Business/Graduate School M.Acc. programs. Students interested in this combined program should contact the coordinator of the M.Acc. program for details. The admission requirements for each program must be met. Beginning with the student's normal entry into the professional program at the start of his senior year it is possible to complete the B.S. in accounting, the M.Acc., and the Juris Doctorate programs during a period of eight semesters and one term in residence and one semester on internship. One semester is completed during the spring/summer terms of the first year.

#### Courses

**332. Advanced Mathematics of Business.** (3:3:0) Prerequisite: Acctg. 232A,B, or Math. III or consent of instructor.

**356. Accounting Information Systems.** (3:3:0) Prerequisites: Acctg. 203; Comput. Sci. 133A, B.

**401. Special Problems in Accounting I.** (2:2:0) Prerequisite: Acctg. 302.

**402. Special Problems in Accounting 2.** (2:2:0) Prerequisite: Acctg. 302.

**403. Accounting for Nonprofit Organizations.** (2:2:0) Prerequisite: Acctg. 202 or 301.

**412. Managerial Accounting.** (3:3:0) Prerequisite: Acctg. 301.

**421. Advanced Tax Problems.** (3:3:0) Prerequisite: Acctg. 321.

**442. Advanced Business Law.** (3:3:0) Prerequisite: Acctg. 342.

**455. Data Processing Systems.** (3:3:0) Prerequisite: Acctg. 356.

**457. Advanced Computer Programming.** (3:1:3) Prerequisite: Acctg. 356.

**465. Auditing Theory and Professional Ethics.** (3:3:0) Prerequisite: Acctg. 302

**475. Current Problems in Accounting Theory.** (3:3:0) Prerequisite: Acctg. 302

**486. Contemporary Professional Accounting Problems.** (3:3:0) Prerequisites: Acctg. 321, completion of or concurrent registration in Acctg. 465, 401, and 402.

**596. Accounting Internship.** (3:0:9) Prerequisite: Acctg. 302. Recommended: Acctg. 465.

Practical on-the-job experience and training in industry, in government, and in public accounting firms.

**612. Managerial Cost Accounting** (3:3:0) Prerequisites: Acctg. 302, 312, 412.

Study of specialized areas in cost determination and cost allocation.

**613. Seminar in Resource Allocation and Control.** (3:3:0)

**621. Tax Research and Planning.** (3:3:0) Prerequisites: Acctg. 321 and preferably Acctg. 421.

Research and solving of tax problems using tax code, regulations, and other sources.

**632. Quantitative Analysis in Business.** (3:3:0) Prerequisite: Acctg. 332.

Application of quantitative analysis to administrative problems.

**665. Auditing Seminar.** (3:3:0) Prerequisite: Acctg. 465.

A study in auditing concepts and philosophy and of their application to modern auditing methods and techniques.

**675. Theory of Accounts and Statements.** (3:3:0) Prerequisites: Acctg. 302, 312, 475.

History and development of accounting and financial statements—their meaning and interpretation. Problems in current accounting theory.

**687R. Seminar in Accounting and Reporting Problems.** (1-3:1-3:0 ea.)

An in-depth study into the current accounting and reporting problems and their solutions.

**691R. Research Seminar.** (1-2:1-3:0)

Three hours of credit are required in the M.Acc. program to cover research methodology, discussion of current topics of student research, and writing a research paper in proper form.

**693. Reading and Conference.** (1-3:1-3:0)

Subject to be arranged with instructor.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

This course number should also be used for continuing registration by students working on theses.

## Agriculture

The graduate program in agriculture offers a Master of Science degree in agribusiness, agronomy, animal science, horticulture, and any combination of these fields. These fields and their respective requirements are listed below.

## Agribusiness (Agricultural Economics)

**Professors.** Carpenter, Corbridge, Fuhrman, Infanger.  
**Associate Professor.** Wood (chairman, 475 WIDB).

**Entrance Examination Required.** None.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Science

**Prerequisites.** An undergraduate degree in any field of agriculture, food science, or closely related field, including the following classes or their equivalent:

Ag. Econ. 112; Acctg. 201, 202; Math. 110R and Acctg. 232; Stat. 221; Comput. Sci. 131 or 133.

**Requirements.** A minimum of 30 semester hours; a supervised special project including a scholarly project report; a final oral examination.

This program is designed primarily as a terminal degree for students who want to obtain a more adequate practical working knowledge of economic and business principles as they apply to agribusiness enterprises.

**Required Courses.** As designated by committee.

## Courses

☐ **Statistics 501, 502.** Statistics for Research Workers I, 2. (5:4:3)

**520. (Ag. Econ.-An. Sci.-Bot.) Management of Ranch Resources.** (3:2:2) Prerequisite: consent of instructor. Corbridge, Shumway, Wallentine

Team taught. Commercial ranch case study. Management plan developed, consisting of maximum profit practices and enterprise combinations.

**521. Management of Cropland Resources.** (3:3:0) Prerequisite: consent of instructor. Corbridge, Robison

Team taught. Commercial farm case study. Management plan developed, consisting of maximum profit practices and enterprise combinations.

☐ **Animal Science 525. Plant Operations.**

**570R. Advanced Topics.** (1-3:1-3:0 ea.) Prerequisite: consent of instructor.

Topics in marketing, policy, computer applications, and international agriculture.

**595R. Individual Readings.** (1-3:Arr.:Arr. ea.)

**597R. Individual Readings.** (1-3:Arr.:Arr. ea.)

**598R. Supervised Field Project.** (1-3:Arr.:Arr. ea.) Prerequisite: approval of supervisor.

Supervised on-the-job training while in the employment of an agribusiness firm. Requires a written report on some aspect of the business operation.

## Agronomy and Horticulture

**Professors.** Allred, Farnsworth, Laws (graduate coordinator, 271 WIDB), Robison (chairman, 275 WIDB).

**Assistant Professors.** Nelson, Williams.

**Program.** Master of Science (M.S.).

**Entrance Examination Required.** A written, comprehensive examination on undergraduate work, normally given during the first week after registration as a graduate student.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Science

**Prerequisites.** Undergraduate major in the field or the equivalent.

**Minors Permissible.** Statistics, computer science, botany, mathematics, or physics; Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.).

**Required Courses.** Stat. 501, 502; Agron.-Hort. 694R, two semesters.

## Courses

**511. Soil Physics.** (3:2:3) Prerequisites: Agron.-Hort. 282; Math. 101 or 105; one semester inorganic chemistry (102 or higher). Laws

Physical properties of soils and their effects upon air, water, and temperature in relation to soil management and crop production.

**514. Soil Microbiology.** (3:2:3) Prerequisites: Agron.-Hort. 282, Chem. 252, Micro. 331.

Ecology and role of soil microorganisms in soil fertility; decomposition of organic matter and waste materials; degradation of pesticides and other agricultural chemicals.

**520. Saline and Alkali Soils.** (3:1:6) Prerequisites: Agron.-Hort. 302, 305. Nelson

Physical and chemical properties of saline and alkali soils—their diagnosis, reclamation, and management for crop production.

☐ **Agribusiness (Ag. Econ.) 521. Management of Cropland Resources.** (3:3:0).

**540. Advanced Crop Production.** (3:3:0) Prerequisites: Agron.-Hort. 151, 305, 559; Bot. 440. Allred

Basic concepts in plant-soil-climatic relationships, with emphasis on recent advances in crop culture and management.

**550. Advanced Horticulture.** (3:3:0) Prerequisites: Agron.-Hort. 318 or 340 or 351, and 352; Bot. 440. Williams

Fundamental principles relating to horticultural practices and physiological development.

**559. Plant Breeding.** (2:2:0) Prerequisites: Agron.-Hort. 151 or equivalent; Bot. 372. Robison

Principles of genetics and methods of plant breeding applied to the improvement of agronomic and horticultural crops.

**560. Soil and Plant Analysis.** (2:0:6) Prerequisites: Agron.-Hort. 305; Chem. 223. Laws

Laboratory chemical analysis of soils and plant materials in soil and plant research.

**598R. Conferences and Reports.** (1-2:1-2:0 ea.) Prerequisite: consent of instructor. Laws

**605. Chemistry of Soil-Plant Relationships.** (4:3:3) Laws  
 Offered 1976 and alternate years.

**607. Soil Physical Conditions.** (3:3:0) Laws

**694R. Seminar** (1:1:0 ea) Laws

**697R. Research.** (Arr. ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr. ea.)

## Animal Science

**Professors.** Cannon (emeritus), Gardner, Hoopes, Orme (chairman, 375 WIDB), Park, Shumway, Wallentine.

**Assistant Professors.** Johnston, Smith.

**Program.** Master of Science (MS).

**Entrance Examinations Required.** None.



**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Science

**Prerequisite.** A bachelor's degree in animal science (20 semester credit hours) or closely related field and 30 semester hours in biological, mathematical and physical sciences.

**Minors Permissible.** Agribusiness, agronomy and horticulture, botany, chemistry, computer science, microbiology, statistics, or zoology.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hour min.).

**Required Courses.** English 316; Stat. 501; An. Sci. 462 or 515, 507, 692R (each semester).

### Courses

☐ **Statistics 501. Statistics for Research Workers I.** (5:4:3)

**462. Reproductive Physiology of Domestic Animals.** (3:2:2) Smith

**507. Animal Nutrition.** (3:3:0) Prerequisites: An. Sci. 207; Chem. 252 or equivalent. Recommended: Chem. 281. Gardner

Functions of nutrients in metabolism, measuring feed values, assessing nutrient requirements.

**508. Animal Nutrition Laboratory.** (2:0:6) Prerequisite: completion of or concurrent registration in An. Sci. 507. Gardner

Sampling methods, chemical analysis of feeds and blood, digestion trials, classical nutritional deficiencies, and research techniques.

**515. Advanced Animal Breeding.** (3:3:0) Prerequisite: An. Sci. 153 or a genetics course. Park

Application of genetic principles for livestock improvement. Emphasis on selection methods and mating systems.

**520. (Agr. Econ.—An. Sci.—Bot.) Management of Ranch Resources.** (3:2:2) Prerequisite: consent of instructor.

Team taught. Commercial ranch case study. Management plan developed, consisting of maximum profit practices and enterprise combinations.

**525. Plant Operations.** (2-5:Arr.: Arr.) Prerequisite: consent of instructor. Johnston

☐ **Statistics 531. Experimental Design.** (3:3:0)

☐ **Statistics 536. Regression Analysis.** (3:3:0)

**560. Advanced Dairy Production.** (3:3:0) Gardner

Includes the physiology and biochemistry of lactation, genetic improvement, dairy layout design, disease control, nutritional requirements. Offered 1975 and alternate years.

**591R. Selected Topics in Animal Science.** (1½-2:Arr.:0)

**595R. Special Problems in Animal Science.** (1-2:Arr.:Arr.) Prerequisite: consent of instructor.

**692R. Seminar.** (1:2:0 ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Anthropology and Archaeology

**Professors.** Christensen, Myers (chairman, 150 MSRB).

**Associate Professors.** Matheny, Berge (graduate coordinator, 120 MSRB).

**Program.** Master of Arts (M.A.) in archaeology only.

**Entrance Examination Required.** A qualifying examination must be taken by September 30 for students entering the program Fall Semester and by January 31 for students entering Winter Semester unless this examination has already been taken at the end of the senior year by students entering the Graduate School from the undergraduate program at Brigham Young University.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Fall and Winter semesters only.

### Master of Arts

**Prerequisite.** Undergraduate major in archaeology or equivalent.

**Fields.** Historic archaeology; prehistoric archaeology.

**Minors Permissible.** Any established minor in the humanities or the sciences; Option II.

**Requirements.** Minimum of 15 semester hours in archaeology and a minor, plus the thesis (6-hr. min.—699); foreign language proficiency when essential to the student's field of research; and a comprehensive examination prior to undertaking thesis research.

**Required Courses.** Archaeology 580R; 590R; at least one of the following area courses: 515, 545, 555; and 455R or comparable field experience.

This department is affiliated with the BYU-New World Archaeological Foundation, which affords some graduate students field experience in Mesoamerica.

The program is designed to prepare students for Ph.D. work and a professional career in archaeology.

### Courses

**515. Advanced Southwestern Archaeology.** (3:2:2)

**545. Advanced Near-Eastern and Mediterranean Archaeology.** (3:2:2)

**555. Advanced Mesoamerican Archaeology.** (3:2:2)

**570. Advanced Museology.** (3:1:4)

**580R. Advanced Theory and Research Design.** (3:3:0 ea.) Prerequisite: consent of instructor.

**590R. Seminar.** (2:2:0 ea.)

**610. Classification of Material Culture.** (3:2:4)

**671. Advanced Interpretive Methods.** (2:2:2)

**695R. Library Research.** (2:0:6 ea.)

**696R. Museum Studies.** (2:0:6 ea.)

**697R. Field Research** (3-10:0:9-30 ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Art and Design

**Professors.** Breinholt (graduate coordinator, F-553 HFAC), Darais, Gunn, Magleby, Turner, Weaver, Wilson.

**Associate Professors.** Burnside, Johansen, Myer, Stout (chairman, B-509 HFAC), Tippetts.

**Programs.** Master of Arts (M.A.), Master of Fine Arts (MFA). Applicants should note the differences between the Master of Arts degree and the Master of Fine Arts degree. Applicants for admission to the

Master of Fine Arts degree program must submit a portfolio of their art work. This should be deposited with the Art Department no later than the application deadlines listed below. Slides will be acceptable for heavy or bulky works.

**Entrance Examination Required.** Interview with a committee of the graduate faculty during registration.

**Application Consideration Dates.** April 1 for Spring and Summer terms and Fall Semester, November 1 for Winter Semester.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** Undergraduate major in art or its equivalent; proficiency in basic drawing and design fundamentals in two-dimensional and three-dimensional work; at least 20 semester hours of upper-division work, including 7 semester hours in art history.

**Areas.** Design, painting, and sculpture.

**Minors Permissible.** One of the above areas may be selected as a minor.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.). At least 15 semester hours, exclusive of thesis, must be in one of the fields listed above and at least 9 semester hours in a minor field.

**Required Courses.** 4 semester hours in Art 600R. The Master of Arts degree is intended to stress the academic thrust of art.

## Master of Fine Arts

**Prerequisites.** Undergraduate major in art or its equivalent; proficiency in basic drawing and design fundamentals in two-dimensional and three-dimensional work; and at least 20 semester hours of upper-division work, including 7 semester hours in art history.

**Areas.** Design (ceramics, crafts, commercial art, printmaking), painting and sculpture.

**Minors.** See below.

**Requirements.** Minimum of 36 semester hours in one of the two areas above, including a minimum of 6 semester hours of MFA project (Art 697R) and 4 semester hours of advanced design (Art 620R); minimum of 12 semester hours in the alternate area (this constitutes the only permissible minor for the MFA degree); minimum of 4 semester hours of graduate level art history. Total hours: 52. Also required are a one-man show of materials produced in this program during the third semester and the public exhibition of the candidate's MFA terminal project. This performance degree must be completed in residence.

Before beginning the fourth semester of his program, the candidate will submit plans to the graduate art faculty for a terminal project of a work or works of art created by the candidate. To be acceptable it must represent a professional level of quality. It may be retained by Brigham Young University as part of its permanent collection.

Although a research thesis is not required, an orderly record will be submitted in which the MFA candidate traces, by means of personal statements, photographs, transcripts, news clippings, correspondence, etc., his artistic development during his time in this program. It will also include an illustrated account of his production of the MFA terminal project described above.

## Courses

**500. Philosophy of the Fine Arts.** (2:2:0) Recommended: Phil. 213 and any of the art appreciation classes, or Hum. 101.

Lecture and seminar for majors in fine arts.

**518. Architectural Mural Media.** (2:2:2) Prerequisites: Art 227, 320, 321 or 322.

Historical backgrounds; studio work in design; execution of murals.

**578R. Art Education Studio.** (1-3:1:5 ea.)

Curricula and projects in art education.

**595R. Seminar.** (1:0:2)

Student and faculty analysis of curricula relationships; projection of student objectives; contemporary topics; visits to current exhibits.

**600R. Individual Study in Art History.** (2-8:Arr.:Arr. ea.)

Allows graduate study in depth into any chosen historical art era.

**618R. Advanced Architectural Mural Media.** (2-8:Arr.:Arr. ea.)

**620R. Advanced Design.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 420R.

**621R. Advanced Drawing.** (2:2:2 ea.)

**622R. Advanced Figure Drawing.** (4:4:4 ea.) Prerequisite: Art 621R.

**627R. Advanced Painting.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 427R.

**633R. Advanced Watercolor.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 433R.

**636R. Advanced Industrial Design.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 436R.

**641R. Advanced Graphic Design.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 441R.

**650R. Advanced Printmaking.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 450R.

**656R. Advanced Sculpture.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 456R.

**659R. Advanced Ceramics.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 459R.

**661R. Advanced Crafts and Advanced Metal.** (2-8:Arr.:Arr. ea.) Prerequisite: Art 461R.

**677. Survey of Recent Studies in Art Education.** (2:2:0)

**679. Advanced Arts and Crafts for Elementary Teachers.** (2:2:1) Prerequisite: consent of instructor.

**690. Color.** (2:2:0)

**695R. Seminar.** (1:1:0 ea.)

**697R. MFA Project for Master's Degree.** (2-8:Arr.:Arr. ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Asian Studies

**Professors.** Farnsworth, Hillam, Hyer, Palmer (coordinator, 121 FOB).

**Associate Professors.** Britsch, Williams.

**Assistant Professor.** Montgomery.

**Program.** Master of Arts (M.A.).

**Entrance Examination Required.** None.

**Application Consideration Date.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.



**Master of Arts**

**Prerequisites.** Proficiency in one Asian language; strong undergraduate preparation in Asian studies.

**Field.** Asian studies.

**Minors Permissible.** Any approved minor.

**Requirements.** The Master of Arts candidate will—

1. Complete a major in one of the departments of the University (all departmental requirements must be fulfilled for the major).
2. Complete at least 15 hours in approved Asian area courses at the graduate level from areas other than the department major, including two seminars in the Asian area.
3. Write a thesis on an Asian subject that is acceptable to both majors (for example, a student in history would write his thesis on Asian history).

**Courses****Economics**

535R. Economic Problems of Asia. (3 ea.)

**History**

- 640R. Problems of Asian History. (3 ea.)  
 648R. Asian Thought and Culture. (3 ea.)  
 690R. Graduate Seminar in History (Asia). (1-3)

**Political Science**

- 501R. Advanced Topics. (3 ea.) (when taken in conjunction with an Asian class)  
 505R. Asian Political Thought. (3 ea.)  
 695R. Seminar in Comparative Government and Politics. (1-3 ea.)  
 697R. Seminar in International Relations (Asia). (1-3 ea.)

**Religion**

555. Comparative World Religions (Asian). (2)  
 556. Comparative World Religions (Asian). (2)  
 559. The Church in Asia. (2)  
 659R. Seminar in History of Asian Religion. (1-6 ea.)

**UNDERGRADUATE (Upper-division)****Anthropology**

350. Peoples of South and East Asia. (3)

**Art and Design**

302. Oriental Art. (2)

**Asian Studies**

499. Senior Seminar in Asian Studies. (3)

**Classical Civilization**

342. Oriental Mythology. (2)

**Economics**

330. Economic Development. (3)

**Geography**

470. Asia. (3)

**History**

340. Premodern Asia. (3)  
 341. Modern Asia. (3)  
 342. Korea. (3)  
 343. Formative Period of Chinese Civilization. (3)  
 344. Modern China. (3)  
 345. Premodern Japan. (3)  
 346. Modern Japan. (3)  
 347. India. (3)  
 348. Southeast Asia. (3)  
 349. Asiatic Russia. (3)  
 440. Communist China. (3)  
 445. History of Asian Religions and Thought. (3)

**Chinese (Mandarin)**

301. Intermediate Modern Chinese 2. (4)

311. Third-Year Conversation. (2)

321, 322. Selected Readings and Composition. (3 ea.)

342R. Chinese Literature in Translation. (3)

441, 442. Classical and Documentary Chinese. (4 ea.)

443. Modern Chinese Literature. (4)

444. Readings in Chinese Social Sciences. (4)

445. Chinese Civilization. (3)

490R. Individual Study in Chinese. (1-3 ea.)

495. Senior Seminar for Majors. (2)

**Japanese**

301. Third-Year Japanese. (4)

311. Third-Year Conversation. (2)

321. Selected Readings and Composition. (3)

322. Selected Readings and Composition. (3)

443, 444. Modern Japanese Literature. (3 ea.)

490R. Individual Study in Japanese. (1-3 ea.)

**Political Science**

350R. Communist and Totalitarian Government and Politics. (3 ea.) (When topic deals with Asia.)

351R. Parliamentary Government and Politics. (3 ea.)

352R. Third-World Government and Politics. (3 ea.) (When topic deals with Asia.)

359R. Topics in Comparative Government and Politics. (3 ea.) (When topic deals with Asia.)

377R. Foreign Relations. (3 ea.) (When topic deals with Asia.)

379R. Topics in International Relations. (3 ea.) (When topic deals with Asia.)

**Religion**

453A. Mormonism and the World's Religions. (2)

**Botany and Range Science**

**Professors.** Andersen, Harper (chairman, 499 WIDB), Hess, Moore, Murdock, Stutz, Vallentine, Weber, Welsh.

**Associate Professors.** Smith, Tidwell, Whitton (graduate coordinator, 495 WIDB).

**Assistant Professors.** Brotherson, Rushforth, Wood.

**Collaborators.** Felker, Frischknecht, Holmgren, Plummer, Thornock, Ware.

**Programs.** Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Entrance Examination Required.** A written diagnostic examination on undergraduate work, normally given during the first month after registration as a graduate student.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

**Master of Science**

**Prerequisites.** Students working toward a graduate degree in botany should have a basic understanding of general botany, cytology, anatomy, taxonomy, genetics, morphology, physiology, and ecology. Students working toward a graduate degree in range science should have a basic understanding of general botany, taxonomy, genetics, physiology, ecology, range management, range analysis, and animal nutrition and management. They will be examined in each of these subject areas in a written diagnostic examination. They should also have training in mathematics, chemistry, physics, microbiology, soils, and zoology adequate for advanced study in areas of specialization. Where deficiencies exist, provision must be made for correcting them.

**Fields.** Biological science education, botany, genetics, range science.

**Minors Permissible.** Any established minor in the sciences, humanities, or social sciences; Option I or II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.).

**Required Courses.** None.

## Doctor of Philosophy Degree in Botany

**Prerequisites.** A master's degree in botany or the equivalent.

**Fields.** Botany, genetics.

**Minors Permissible.** Any minor.

**Requirements.** Minimum of 30 semester hours of course work approved by the student's graduate committee plus dissertation (18-hr. min.).

Option I. A major and minor field within the department plus a minor field outside the department. The number of hours in each will depend upon the background, interests, and competence of the student.

Option II. A major field within the department with a program of supporting courses plus a minor field outside the department. The number of hours in the major and minor fields will depend upon the background and competence of the student.

**Required Courses.** Graduate seminars.

## Botany

### Courses

**501. Histological Technique.** (2:0:6) Prerequisite: Bot. 101 or Zool. 105. Moore

Techniques of preparing plant tissues for microscopic examination. Offered 1975-76 and alternate years.

**510. Advanced Taxonomy.** (3:2:3) (One three-day field trip to be arranged.) Prerequisites: Bot. 210 or consent of instructor. Welsh

**515. Agrostology: Taxonomy and Ecology of Grasses.** (3:2:4) Prerequisite: Bot 210. Brotherson, Wood

Classification and ecology of grasses. Important forage species are emphasized. Offered 1976-77 and alternate years.

**522. Biological Instrumentation.** (3:1:6) Prerequisite: permission of instructor. Weber

Theory and application of research instruments to biological problems.

**526. (Bot.-Zool.) Cell Biology** (4:3:3) Prerequisites: Introductory course in biochemistry. Staff

Molecular physiology and ultrastructure of cells, with emphasis on eucaryotic organisms. Offered 1975-76 and alternate years.

**533. Algology.** (3:2:3) Prerequisite: Bot. 331 or consent of instructor. Rushforth

A detailed study of the algae, including classification and morphology.

**535. Advanced Mycology.** (4:2:6) Prerequisite: Bot. 335 or equivalent. Weber

A detailed study of taxonomy and morphology of special groups. Offered 1975-76 and alternate years.

**539. Paleobotany.** (3:2:3) Prerequisites: Bot. 101 or 105; Geol. 103. Tidwell

**550. North American Floristic Elements** (3:2:3) Welsh

The distribution of plant species and communities in the light of present and past climates. Offered 1975-76 and alternate years.

**551. Quantitative Ecology.** (3:3:0) Prerequisite: Bot.-Zool. 350 and Bot. 453. Harper

Methods used in community analysis.

**552. (Bot.-Zool.) Terrestrial Ecosystems.** (4:3:Arr.) Prerequisites: Bot.-Zool. 350, Stat. 221 or 501.

Harper, Murdoch

Biotic communities of the earth; population dynamics; reproductive, lifeform, and longevity patterns; species interactions; and structure, dynamics, and evolution of communities. Extended field trip.

**555. (Bot.-Zool.) Aquatic Ecosystems** (3:2:3) Prerequisites: Bot.-Zool. 350 or equivalent; Stat. 221 or 501.

Analysis of lake and stream ecosystems. Three Saturday field trips. One extended field trip.

**610. Botanical Terminology and Nomenclature.** (2:2:0) Prerequisite: consent of instructor. Welsh

A detailed study of botanical terminology, including the contributions of Latin and Greek words, their gender, number, and case. Offered 1976-77 and alternate years.

**621. Electron Microscopy.** (2:2:0)

Hess

Theoretical and practical electron microscopy of biological material.

**622. Electron Microscopy Laboratory.** (1:0:3) Prerequisites: consent of instructor and completion of or concurrent registration in Bot. 621. Hess

Laboratory to accompany Bot. 621. Essentially individual instruction.

**630. Angiosperm Morphology.** (4:3:3) Prerequisite: familiarity with taxonomy, anatomy, and physiology or biochemistry. Tidwell

Offered 1976-77 and alternate years.

**634. Morphogenesis.** (3:2:3) Prerequisites: familiarity with taxonomy, anatomy, and physiology or biochemistry. Moore

The development of form in organisms. Offered 1975-76 and alternate years.

**638. Genetics of the Fungi.** (2:2:0) Prerequisite: a laboratory course in microbiology, botany, or zoology. Andersen

Offered 1976-77 and alternate years.

**641. Physiology of Fungi and Algae.** (4:3:3) Prerequisites: Bot. 335 and 440. Weber

Offered 1975-76 and alternate years.

**650R. Advanced Topics in Plant Ecology.** (2:2:0) Staff

Current trends in ecological research and philosophy.

**676. Cytogenetics.** (3:2:3) Prerequisites: genetics and cytology. Anderson, Stutz

Offered 1976-77 and alternate years.

**678. Organic Evolution.** (3:3:0) Prerequisite: genetics or consent of instructor. Stutz

**691R. Graduate Seminar.** (1:1:0 ea.)

**698R. Special Problems.** (1-3:0:3-9 ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**740R. Advanced Topics in Plant Physiology.** (3:2:3) Prerequisites: Bot. 440; Chem. 351. Smith

**742. Plant Nutrition and Growth.** (3:2:3) Prerequisite: Bot. 440. Smith

Offered 1976-77 and alternate years.

**776. Population Genetics.** (3:3:0) Prerequisite: genetics and consent of instructor. Stutz

Offered 1975-76 and alternate years.

**799. Doctoral Dissertation.** (Arr.)

## Range Science

### Courses

**520. (Agr. Econ.-An. Sci.-Bot.) Management of Ranch Resources.** (3:2:2) Prerequisite: consent of instructor.



Team taught. Shumway, Corbridge, Vallentine.  
Commercial ranch case study. Management plan developed, consisting of maximum profit practices and enterprise combinations.

**561. Watershed Management.** (3:2:3) Harper, Murdock

**691R. Graduate Seminar.** (1:1:0 ea.)

**698R. Special Problems.** (1-3:0:3-9 ea.)

**699. Thesis for Master's Degree** (6-9:Arr.:Arr.)

## Business Education

**Professors.** Bell (graduate coordinator, 353 JKB), D. Peterson, Waters.

**Associate Professors.** Nelson (chairman, 351 JKB), Perry, B. Petersen, G. Smith, H. Smith, Stoddard, Warner.

**Assistant Professors:** Ashby, Baker, Boyer.

**Programs.** Master of Science (M.S.), Doctor of Education (Ed.D.).

**Entrance Examinations Required.** None for Master's Program; Graduate Record Examination and Miller Analogies Test for Doctoral Program.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Science

**Prerequisites.** Bus. Ed. 320 or equivalent. Background in statistics.

**Fields.** Distributive education, office education.

**Minors Permissible.** Any approved minor.

#### Requirements

**Option I:** Minimum of 24 semester hours plus thesis (6-hr. min.).

**Option II:** Minimum of 38 semester hours (no thesis).

#### Required Courses

**Option I:** Bus. Ed. 605, 625, and 3 hours of 515R.

**Option II:** Bus. Ed. 605, 625, 635, and 3 hours of 515R.

This program is designed to prepare business teachers for junior colleges and other postsecondary institutions and to improve instruction for secondary school business teachers.

### Doctor of Education

**Prerequisites.** Master's degree; one year of professional teaching experience; background work in mathematics, statistics, computer science, and College of Business. Common body of knowledge requirements.

**Field.** Business education.

**Minors.** None required.

**Requirements.** Acquisition of professional and academic competencies in teaching excellence, research, supervision and administration, and designated subject fields in business education.

**Required Courses.** Bus. Ed. 790R (doctoral seminars); Bus. Ed. 799 (doctoral dissertation); additional course work as determined by advisory committee.

### Courses

**515R. Methods of Instruction in Business Education.** (2-3:Arr.:Arr. ea.)

An analysis of classroom methods, psychology of learning, and research findings pertaining to improvement of instruction in any of the following areas: typewriting, shorthand, bookkeeping, economic education, and distributive and cooperative education.

**530. Current Developments Influencing the Curriculum and Content of Business Education.** (2:2:0)

A study of recent technological developments, such as automation in business, and an analysis of the content, materials, and procedures of business education.

**590R. Seminar in Business Education.** (1-2:Arr.:Arr. ea.)

An intensive clinic emphasizing teaching methodology in one or more selected topics in business education.

**605. Introduction to Research in Business Education.** (3:3:0)

An examination of research methods and procedures applicable to business education, with emphasis on the analysis and evaluation of methodology reflected in existing research.

**625. Testing and Evaluation in Business Education.** (3:3:0) Prerequisite: Stat. 221 or equivalent.

A survey of classroom tests and instruments of evaluation used in business education, and an analysis of their uses and methods of construction.

**635. Implications of Research for Improved Classroom Instruction.** (3:3:0)

Review and analysis of recent research in business education, and evaluation of its implications for improved classroom instruction.

**692. Research Project.** (1-4:Arr.:Arr.)

**694. Independent Readings.** (1-2:1-2:0)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**790R. Doctoral Seminar.** (Arr.)

Forum for interchanges among faculty and doctoral students that will contribute to the acquisition of professional competencies prescribed by major department and advisory committee.

**799. Dissertation.** (Arr.)

## Business Management

**Professors.** E. Christensen, Daines (director, MBA Program, A-253 JKBA), Dalton, W. Dyer, Edwards, Oaks, Orton, Taylor, Woodfield.

**Associate Professors.** Barnes, Call, S. Covey, Garrison, Lambert, McKinnon, Nelson, Rickenbach, Ritchie, Stanford, Stoddard, Thompson.

**Assistant Professors.** Cox, Crawford, Hardy, Jackson, Lee, Schill, Wistisen.

**Program.** Master of Business Administration (MBA).

**Entrance Examination Required.** Admission Test for Graduate Study in Business offered by the Educational Testing Service, Box 966, Princeton, New Jersey 08540.

**Application Consideration Dates.** Continuously from February 1 to May 1.

**Entry Time.** Fall Semester only.

The MBA program is designed primarily for the non-business management major. Although the candidate will gain a general understanding of the functions and relationships of business, the primary objective of the MBA program is to develop his creative problem-solving skill.

### Master of Business Administration

The Master of Business Administration program awards an MBA degree at the successful completion of a two-

year graduate course of study. The summer months are to be used at the discretion of the candidate, although work in industry is encouraged.

The major focus of the MBA is an integration of the managerial functions. The curriculum attempts to fulfill this major task by utilizing the following basic stems of training: (1) administrative, (2) environmental, (3) operations, (4) quantitative-analysis, and (5) communications.

The administrative stem embraces principles of human behavior, organization theory, and business policy. In the environmental stem one is involved with micro- and macroeconomics, government and business, and international business. The operations stem involves production, marketing, and finance. In the quantitative stem a candidate receives an extensive and intensive exposure to mathematics, accounting, statistics, electronic computer programming, and operations research. Finally, in the communications stem, a candidate considers and uses the written word in case analysis and research reports.

This program is designed to challenge the initiative and self-discipline of each student. Such challenges will provide many personal satisfactions—the power and skill to implement change, the excitement of solving complex organizational problems, future financial rewards, and the confidence to work effectively with other people. To provide the professional training for such satisfactions and rewards the MBA candidate will be expected to become proficient in the following areas:

1. Theory: A basic understanding of the principles of management combined with an appreciation of the interrelationships involved in dealing with people and organizations
2. Environment: An awareness of and ability to deal effectively with the changing economic, technological, political and social environment in which business operates
3. Communication: Proficiency in expressing, defending, and modifying positions in a simulated business environment
4. Decision-making: The ability to analyze business problems, make decisions, and implement decisions to achieve the strategic goals and objectives of the individual and the organization

**Prerequisites.** A bachelor's degree in a nonbusiness management field; five semester hours of college algebra and trigonometry. A two-week preschool math course is required for candidates who have not satisfactorily completed a course in calculus.

**Minors Permissible.** None.

**Requirements.** 70 semester hours.

**Required Courses.** Consult departmental brochure.

## Courses

### 610. Managerial Economics. (3:3:0)

Analysis of the decision-making behavior of consumers and firms in a market economy.

### 611. Written and Oral Communication 1. (1:1:0)

Development of skills for effective case writing, management reporting, and oral presentation.

### 612. Mathematics for Business Analysis. (2:3:0)

Techniques of mathematics with special emphasis on applications to business situations. Introduction to concepts of differential and integral calculus.

### 613. Computer Language. (1:3:0)

Students learn and use a computer language to solve business-related problems.

### 614. Management Control 1. (3:3:0)

Accounting as a tool for management control. Development of basic accounting concepts essential in the internal planning and control process.

### 616. Organizational Behavior. (3:3:0)

Concepts of human relations theory as it relates to personal, interpersonal, group, and organization behavior.

### 620. Environmental Economics. (3:3:0)

Analysis of national income and its determinants. Fiscal and monetary policies as means of controlling national income.

### 621. Written and Oral Communication 2. (1:1:0)

Development of skills for effective case writing, management reporting, and oral presentation.

### 622. Statistics for Business Analysis. (2:3:0)

Review of quantitative measurements to describe data. Concepts of probability, sampling, and tests of hypothesis. Introduction to simple and multiple correlation and regression.

### 623. Management Simulation. (1:2:0)

Integration of functional areas of business and organizational behavior through use of computer simulation techniques.

### 624. Management Control 2. (3:3:0)

Accounting as a means of coordinating the operations of a firm with market conditions.

### 625. Marketing Management 1. (3:3:0)

The development of analytical marketing tools and techniques and their utilization in the analysis of cases in the various decision areas of marketing management.

### 627. Operations Management. (3:3:0)

An introduction to operations management techniques.

### 628. Financial Management. (5:3:0)

Finance from the business manager's point of view. Emphasizes the use of financial statements and develops techniques and concepts for the analysis of liquidity, profitability, and financial planning.

### 631. Written Analysis 2. (1:1:0)

The preparation of a major topical research report drawn from first-hand industrial observation.

### 635. Buyer Behavior and Marketing Decisions (3:3:0)

Analysis of markets and market segments as they influence marketing decisions. A major research project is required.

### 636. Management and Organization Development. (3:3:0)

Analysis of organization structure and design, organizational motivation and control, and the management of change in organizations.

### 638. Seminar in Corporate Finance. (3:3:0)

Topics in financial management. Emphasis on recent financial theory and practice and the use of computers and quantitative models in financial management.

### 639. Business Policy 1. (3:3:0)

A top-management approach to the problems of determining corporate strategy.

### 642. Decision Theory. (1:3-5 wks.:0)

Business decision-making under uncertainty, primarily through the use of Bayesian statistics.

### 643. Computers and Management. (1:3-5 wks.:0)

Electronic data processing—its significance for management: computers, techniques of systems designs, and management problems concerned with the mechanization of data processing.

### 649. Business Policy 2. (3:3:0)

A top-management approach to the problem of implementing corporate strategy.

### 652. Advanced Operations Analysis. (3:3:0)

Operations research/management science techniques as a managerial aid to decision-making under certainty and uncertainty with emphasis on linear programming, dynamic programming, queuing theory, and market processes.



**654. Controls 3. (3:3:0)**

Profit planning, cost analysis, and impact of federal income taxes on business decisions.

**655. Quantitative Methods in Marketing Analysis. (3:3:0)**

Prerequisite: Bus. Mgt. 635.  
Application of such methods as multidimensional scaling, multiple-discriminant analysis, Bayesian decision-making, analysis of variance, and regression and evaluation.

**657. Systems Analysis and Design. (3:3:0)**

Business systems analysis and design as applied to situations ranging from small intracompany functional units to large company-industry interactions.

**658. Investments. (3:3:0)**

The principles and practice of investment, with special attention to investment analysis and portfolio selection and management.

**659. New Enterprise Management. (3:3:0)**

Concepts and skills of entrepreneurship, plus student teamwork with an actual developing enterprise.

**660. The Business Administrator and Government Policy. (3:3:0)**

The impact of governmental policies and practices on a business administrator.

**665. Sales and Distribution Management. (3:3:0)**

Analysis of sales methods, organization and management as they influence the field sales force and institutions including both independent and integrated distribution systems.

**668. The Capital Markets: Structure and Analysis. (3:3:0)**

Organizations and function of the United States capital markets; relationship to money markets; historical background; structure of stock exchanges and over-the-counter markets; analysis of significant economic problems and trends especially contemporary, in the capital markets.

**675. International Business Management. (3:3:0)**

Problems and policies of multinational corporations operating in different international economic settings. Topics include financing exports in foreign operations, marketing and market research, and management and personnel practices.

**678. Seminar in Finance. (3:3:0)**

Intensive study of some phase of finance or investment management. The particular topic for study in each section of the seminar will be announced in advance.

**679. Business, Society, and the Individual. (3:3:0)**

Analysis of the role of the business organization with respect to (1) its larger environment and (2) the individual in society.

**685. Seminar in Marketing. (3:3:0)**

Managerial decision-making concerning marketing problems in evaluating environmental and market forces, pricing, distribution, and promotion decisions; emphasizing acquisition and use of both behavioral and quantitative information.

**693. Readings and Conference. (1-3:Arr.:0)**

Subject to be arranged with the instructor.

## Chemistry

**Distinguished Professor.** Hall.

**Professors.** Anderson, Blackham, Bradshaw, Broadbent, Bryner (emeritus), Butler (chairman, 226 ESC), Castle, Cluff, Goates, Gubler, Hawkins, Izatt, Mangum, Nelson, Ott, Smith, Snow, Swensen, Vernon, White (biochemistry coordinator, 695 WIDB), Wilson.

**Adjunct Professor.** Jensen.

**Associate Professors.** Bills, Dalley, Hansen, Mangelson, Nordmeyer, Pack, Paul, Thorne (graduate coordinator, 116 ESC), Woolley.

**Programs.** Master of Science (M.S.), Master of Arts (M.A.-3 Program), Doctor of Philosophy (Ph.D.).

**Entrance Examination Required.** A written examination of the student's undergraduate preparation in chemistry, given during the week preceding his initial registration.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

**Teaching.** The Chemistry Department relies upon its graduate students for many assignments in laboratory and recitation instruction. Unless a student is excused by the faculty he will be expected to teach a cumulative total of at least two semesters at 20 hours a week during his residency toward the doctoral degree, half of which must come after his first year in residency. Master's degree candidates are expected to teach half this amount.

### Master of Science

**Prerequisite.** Undergraduate major in chemistry or the equivalent. Proficiency in French, German, or Russian; or in mathematics beyond calculus; or in computer science.

**Fields.** Analytical-physical chemistry; biochemistry (see Graduate Section of Biochemistry); inorganic chemistry; organic chemistry; physical chemistry.

**Minors Permissible.** Option I or Option II.

**Requirements.** 24 semester hours plus a thesis (6-hr. min.—699).

**Required Courses:** As specified by committee.

### Master of Arts

(M.A.-3 Program)

**Prerequisite.** Undergraduate major in chemistry or the equivalent.

**Requirements.** The department offers the three-year master's degree program wherein the student wishing to prepare for high school or junior college teaching may obtain the Master of Arts degree in chemistry. This program will normally begin at the end of the student's sophomore year. Details may be obtained from the chairman of the Chemistry Department.

**Field.** Chemistry teaching emphasis.

### Doctor of Philosophy

**Prerequisites.** Baccalaureate degree in chemistry or the equivalent. Proficiency in French, German, or Russian; or in mathematics beyond calculus; or in computer science.

**Fields.** Analytical-physical chemistry; biochemistry (see Graduate Section of Biochemistry); inorganic chemistry; organic chemistry; physical chemistry.

**Minors Permissible.** Any approved minor.

**Requirements.** Approved courses plus a dissertation (18-hr. min.—799).

### Graduate Section of Biochemistry

**Professors.** Gubler, Mangum, Smith, Swensen, Vernon, White (chairman and graduate coordinator, 695 WIDB).

Graduate degrees in biochemistry are administered by the biochemistry faculty of the Chemistry Department. Qualified faculty in other departments may (with approval of the graduate dean) become active members of the graduate section of biochemistry and serve as members or chairmen of graduate advisory committees.

**Programs.** Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Entrance Examination Required.** Students are accepted on a provisional basis until: (1) completion of the written appraisal examinations designed to evaluate their competence in undergraduate chemistry and (2) successful removal of deficiencies revealed by this examination. The examination is administered by the graduate section of biochemistry the week preceding initial registration.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

**Teaching.** Students will be expected to teach a cumulative total of at least two semesters at 20 hours per week.

### Master of Science

**Prerequisite.** Baccalaureate degree in physical, biological, or agricultural sciences from an accredited college or university. Students with bachelor's degrees in fields other than chemistry should have successfully completed one-year courses in organic and in physical chemistry.

**Fields.** Biochemistry.

**Minors Permissible.** Any established minor in the physical, biological, agricultural, or food sciences; Option II.

**Requirements.** Courses (24 semester hr. minimum), thesis (6-hr. minimum—699), annual progress review, and final oral examination, all approved by graduate advisory committee.

The final oral examination for the M.S. will consist of two parts: (1) a public presentation of the candidate's original research described in his thesis and (2) a comprehensive examination on course work, research, and thesis, administered by the graduate advisory committee.

**Required Courses.** Chemistry 694R (every semester in residence), 685, 686, and 687.

### Doctor of Philosophy

**Prerequisite.** Baccalaureate degree in physical, biological, or agricultural sciences from an accredited college or university. Students with bachelor's degrees in fields other than chemistry should have successfully completed one-year courses in organic and in physical chemistry.

**Fields.** Biochemistry.

**Minors Permissible.** Any established minor in the physical, biological, agricultural, or food sciences, or combination thereof.

**Requirements.** Courses, research, annual progress review, oral proposition, comprehensive examination, and dissertation (18-hr. minimum—799), all approved by graduate advisory committee.

The oral examination on the dissertation consists of two parts: (1) a public presentation of candidate's original research described in his dissertation and (2) an oral examination, primarily on the dissertation.

**Required Courses.** Chemistry 694R (every semester in residence), 685, 686, and 687.

### Courses

**501. Symmetry in Chemistry.** (2:2:0)

**514. Inorganic Chemistry.** (3:3:0)

**518. Inorganic Syntheses.** (2:0:6)

Offered 1975-76 and alternate years.

**521. Analytical Chemistry.** (2:2:0) Prerequisite: Chem. 464.

**522. Chemical Instrumentation.** (2:0:6)

**523. Instrumental Analysis.** (2:1:3) Prerequisite: completion of or concurrent registration in Chem. 464.

**551. Systematic Identification of Organic Compounds.** (3:4:2:3-6)

**552. Advanced Organic Chemistry.** (3:3:0)

**561. Chemical Thermodynamics.** (3:3:0) Prerequisite: Chem. 462.

**562. Advanced Chemical Thermodynamics.** (2:2:0) Prerequisite: Chem. 561.

Offered 1975-76 and alternate years.

**563. Reaction Kinetics.** (2:2:0)

Offered 1975-76 and alternate years.

**564. Nuclear and Radiochemistry.** (2:2:0) Prerequisite: Chem. 462.

Offered 1976-77 and alternate years.

**565. Introduction to Quantum Chemistry.** (3:3:0) Prerequisite: Chem 462.

**594R. General Seminar.** ( $\frac{1}{2}$ :1:0 ea.) Required of all senior A.C.S.-approved majors and graduate students in chemistry every semester in residence.

**598. Special Problems.** (Arr.) Registration by permission.

**600. Directed Teaching in Chemistry.** (1:1:0)

**601. Geometry of Atoms and Molecules.** (2:2:0) Prerequisite: Chem. 501.

Offered Fall 1976 and Winter 1978.

**611. Chemistry of Main Group Elements.** (3:3:0)

Offered 1975-76 and alternate years.

**612. Chemistry of Transitional Elements.** (3:3:0)

Offered 1976-77 and alternate years.

**658. Organic Synthesis.** (3:1:6)

Offered every third semester.

**685, 686. Advanced Biochemistry.** (3:3:0 ea.)

**687. Advanced Biochemistry Laboratory.** (2:0:6)

**694R. Biochemistry Seminar.** (1:1:0 ea.)

Weekly seminar on current topics given by invited guests and by BYU faculty and graduate students. Required of all graduate students in biochemistry every semester in residence.

**697R. Master's Candidate Research.** (Arr. ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**719. Selected Topics in Inorganic Chemistry.** (1-3:1-3:0)

**729. Selected Topics in Analytical Chemistry.** (1-3:1-3:0)

**751. Mechanisms of Organic Reactions.** (3:3:0)

Offered Fall 1975 and Winter 1977.

**757. Chemistry of Natural Products.** (3:3:0)

Offered 1976-77 and alternate years.

**758. Heterocyclic Compounds.** (3:3:0)

Offered 1975-76 and alternate years.

**759. Selected Topics in Organic Chemistry.** (1-3:1-3:0)

**761. Statistical Mechanics.** (3:3:0)

Offered 1976-77 and alternate years.

**765. Quantum Chemistry.** (3:3:0) Prerequisite: Chem.



565. Recommended: Chem. 501.

Offered 1975-76 and alternate years.

769. Selected Topics in Physical Chemistry. (1-3:1-3:0)

789. Selected Topics in Biochemistry. (1-3:1-3:0)

797R. Doctoral Candidate Research. (Arr. ea.)

799. Dissertation for the Ph.D. Degree. (Arr.)

## Child Development and Family Relationships

**Professors.** Cannon, Knowles, Moss (chairman, 1239 SFLC), Porter, Rollins.

**Associate Professors.** Allred, Burr, Cahoon, Hoopes, Mead, Olson, Price, Scoresby.

**Assistant Professors.** Bahr, Larsen, McKee, Taylor.

**Programs.** Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** An oral evaluation interview with all Ph.D. candidates. When a personal meeting is not feasible, additional written information about the student's background and academic goals will be requested. The MMPI is required of all applicants in the marriage and family counseling area.

**Application Consideration Dates.** All sections of the application form for the Fall Semester must be in the CDFR Department by March 1. Since the applications have to be processed through the Graduate School before they come to the department, completed applications should be submitted to the Graduate School by January 1. Limited availability for Winter Semester may be considered November 15, depending upon enrollment.

**Entry Times.** Fall and Winter semesters. Background work may be completed during the Spring or Summer terms preceding a Fall Semester entrance.

### Master of Science

**Prerequisites.** An introductory statistics course that includes inferential statistics (i.e., Psych. 370, Sociol. 206, Stat. 221, or Stat. 552 at BYU) and a research methods course (i.e., Psych. 369 or Sociol. 300). In addition, area prerequisites are—

Family Relationships: CDFR 460 and an upper-division undergraduate course in social psychology or sociological theory.

Child Development: CDFR 410 and an upper-division undergraduate course in personality or learning theory.

Marriage and Family Counseling. CDFR 410 or 460, or equivalent, and an upper-division undergraduate course in learning theory.

**Fields.** Child development, family relationships, marriage and family counseling.

Special emphasis in early childhood or family life education is currently available as an Option II program.

**Minors Permissible.** Any minor approved by the advisory committee, or Option II.

**Requirements.** Acquire and demonstrate the competence identified for the degree.

**Required Courses.** As designated by committee.

### Doctor of Philosophy

**Prerequisites.** A master's degree in this or a related field, or the equivalent.

**Fields.** Child development and family relationships, marriage and family counseling.

**Minors Permissible.** Any minor approved by the advisory committee.

**Requirements.** Satisfy University residence identified for the degree; pass a written comprehensive examination; and complete an acceptable dissertation, including enrollment for 18 hours of dissertation credit.

### Courses

**501R. Workshop in Child Development.** (1-2:1-2 wks., 8 hrs./day:0 ea.) Prerequisite: 8 hours in CDFR or consent of department chairman.

Intensive study in the application of principles of child development and child guidance.

**502R. Workshop in Family Relationships.** (1-2:1-2 wks.; 8 hrs./day:0 ea.) Prerequisite: 8 hours in CDFR or consent of department chairman.

Intensive study in the application of principles of family relationships.

**503R. Workshop in Marriage and Family Counseling.** (1-2:1-2 wks.; 8 hrs./day:0 ea.) Prerequisite: 8 hours in CDFR or consent of department chairman.

Intensive study in the application of principles of marriage and family counseling.

**514. Theories of Child Development.** (3:3:0) Prerequisite: CDFR 410.

An intensive investigation of theoretical frameworks, models, and concepts of dominant contemporary theories in child development.

**530. Problems of Teaching Marriage and Family Relationships in College.** (2:2:0)

**540. Introduction to Theories for Marriage and Family Counseling.** (3:3:0) Prerequisite: CDFR 460. Recommended: CDFR 461.

Theories and techniques used in marriage and family counseling. Consideration of individual and group counseling as they pertain to the family.

**555A,B. Beginning Practicum in Marriage and Family Counseling.** (3:2:2-4 ea.) Prerequisites: CDFR 540 and consent of instructor.

Experience in organization and administration of family consultation with (A) young children and (B) adolescents.

**560. Advanced Family Relationships.** (3:3:0) Prerequisite: CDFR 460.

Analysis of theories and research about the premarital dyad, marital dyad, and family interaction.

**590R. Readings in Child Development and Family Relationships.** (1-2:1-2:0) Prerequisites: CDFR 410 or 460 and consent of instructor.

Discussions and reports of current readings in this field.

**595R. Special Topics in Child Development and Family Relationships.** (1-2:1-2:0) Prerequisites: CDFR 410 or 460 and consent of instructor.

Individual study for qualified students majoring in child development and family relationships, upon consultation with the instructor and the department chairman.

**596R. Research Methodology.** (3:2:2 ea.) Prerequisites: CDFR 410 or 460; Stat. 552 (concurrent registration permitted).

Principles of research methodology applied to the identification, evaluation, creation, and utilization of empirical knowledge in child development-family relationships.

**610. Physical and Intellectual Development of Children.** (3:3:0) Prerequisite: CDFR 514.

A systematic survey of current theories and research on physical and intellectual development from conception through adolescence.

**611. Emotional and Social Development of Children.** (3:3:0) Prerequisite: CDFR 514.

A systematic survey of current theories and research on emotional and social development from conception through adolescence.

**622R. Supervision and Administration in Early Childhood Education.** (2:2:TBA ea.) Prerequisites: CDFR 210, 323, 422.

A practicum for developing administrative and supervisory skills in training teachers of preschool children.

**623. Curriculum Development in Preschool Education.** (2:2:2) Prerequisites: CDFR 323, 422; Ed. 301.

Comparison and evaluation of various preschool curricula; examination of research in preschool curricula; application of preschool curricular innovations; application of criterion tests related to various preschool curricula.

**630. Parent Education.** (2:2:0) Prerequisite: CDFR 410 or 460.

Basic principles in organization of parent study programs. Formulation and presentation of program for parents.

**640. Theories of Counseling Marital Dyads in Groups.** (3:3:0) Prerequisite: CDFR 540.

**649. Systems Analysis for Marriage and Family Counseling.** (3:2:2) Prerequisites: CDFR 445, 540.

Application of systems theory in the development of intervention for use with marriages and families.

**655A,B. Intermediate Practicum in Marriage and Family Counseling.** (4:1:6 ea.) Prerequisites: CDFR 540 and consent of instructor.

Supervised experience and sensitivity training in counseling of (A) marital dyads and (B) groups of marital dyads.

**660. Dynamics of Parent-Child Interaction.** (2:1:2)

Development and testing of conceptual models of parent-child interaction.

**661. Dynamics of Family Interaction.** (2:2:0) Prerequisite: CDFR 560.

**662. Dynamics of Marital Interaction.** (2:2:0) Prerequisite: CDFR 560.

Systematic study of the research and theory of man-woman relationships in marriage.

**663. Critical Problems in Family Life.** (2:2:0) Prerequisite: CDFR 560.

**665. The Premarital Dyad.** (2:2:0) Prerequisite: CDFR 560.

Advanced seminar on theories and research related to premarital relationships.

**691R. Seminar in Child Development.** (1-2:1-2:0 ea.)

**692R. Seminar in Family Relationships.** (1-2:1-2:0 ea.)

**696R. Advanced Research Methodology.** (2:1:2 ea.) Prerequisites: CDFR 596R; Stat. 554.

Application of principles of descriptive and experimental research methods, measurements, and multivariate analysis to research problems in child development and family relationships.

**697R. Independent Research.** (1-3:1-3:0 ea.) Prerequisites: CDFR 596R; Stat. 554.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**730. Seminar in Family Life Education.** (2:1:2) Prerequisite: consent of instructor.

**740. Theory Building in Marriage and Family Counseling.** (3:3:0) Prerequisite: CDFR 540.

**749. Supervision in Marriage and Family Counseling.** (3:2:2) Prerequisites: CDFR 540, 649.

Analysis and practice of techniques in the supervision of marriage and family counselors.

**755A,B. Advanced Practicum in Marriage and Family Counseling.** (1-4:6-10 ea.) Prerequisites: CDFR 740 and consent of instructor.

**760. Concepts and Theories of Marriage and the Family.** (3:3:0) Prerequisite: CDFR 560.

**791R. Seminar in Child Development.** (1-2:1-2:0 ea.) Prerequisite: must be a Ph.D. candidate in child development.

**792R. Seminar in Family Relationships.** (1-2:1-2:0 ea.)

**793R. Seminar in Marriage and Family Counseling.** (1-2:1-2:0 ea.)

**794. Special Topics in Child Development.** (1-2:1-2:0)

**795. Special Topics in Family Relationships.** (1-2:1-2:0)

**799. Dissertation for the Ph.D. Degree.** (Arr.)

## Communications

Professors. G. Barrus, Bradley, Burnett (chairman, D-501 HFAC), Haroldsen, Rich, Smith.

Associate Professors. Barney (graduate coordinator, D-501 HFAC), Beckham, Fairbanks.

Assistant Professors. Hickman, Mills.

**Program.** Master of Arts (M.A.).

**Application Consideration Dates.** March 1, June 1, and November 1 each year.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** A bachelor's degree in communications or allied fields or the equivalent; statistics. Professional experience in the area of communications is highly desirable. Professional competence in written and spoken English is necessary.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699).

**Required Courses.** Comms. 610, 611, Comm. 613 recommended.

**Examinations.** Written comprehensive and final oral examination required.

The program is designed to prepare qualified students for responsible and creative leadership as mass communication specialists or as teachers in the field. It emphasizes general studies which have common application to a number of professional specializations, including newspaper and magazine editing and publishing, commercial broadcasting, educational broadcasting, advertising, public relations, and communications research. (Full details on the program are available in the Communications Department Guide to Graduate Study.)

Students desiring to complete a graduate minor in communications should consult the department chairman or graduate coordinator regarding a recommended program of study.

## Courses

**501. History of Mass Communications.** (2:2:0)



Development of the print, film, and broadcast communication media from their beginnings to the present, and their roles as institutions in American society.

**510. Mass Media Administration.** (2:2:0) Prerequisite: Comms. 312 or 439 or 449.

Problems of organization and administration for newspapers, magazines, radio stations, and television stations.

**521. Opinion Writing.** (2:2:0) Prerequisite: Comms. 312 or consent of instructor.

Opinion function of the mass media in editorials, columns, commentaries, and reviews.

**528. Magazine Editing and Publishing.** (2:2:0) Prerequisite: Comms. 312.

Principles of layout and design for magazines and business publications. Contemporary practices in content and production.

**550. Instructional Telecommunication Production.** (2:2:2) Prerequisite: consent of instructor.

Producing modules and units of predesigned instructional packages.

**556. Advanced Program Development and Production.** (2:4:1:3-6) Prerequisite: consent of instructor.

An advanced course in broadcasting and film production, observing professional standards.

**580. Comparative World Communication Systems.** (2:2:0)

Mass media systems in developing authoritarian and free nations. Relationship of these systems to government.

**581. International Communication Problems.** (2:2:0)

An examination of the cultural, physical, and governmental barriers to the flow of information between nations. Role of the press in foreign policy. International propaganda.

**610. Studies in Communication Theory.** (3:3:0) Recommended: Comms. 201 or equivalent; one or more courses in philosophy, psychology, and sociology.

A study of the historical and philosophical development of communications theory, with special application to problems of the mass media.

**611. Research Methods in Mass Communication.** (3:3:0) Prerequisites: Stat. 221 or equivalent, Psych. 370, or Sociol. 606.

Research techniques in communication fields, including readership, readability, and audience measurement. Introduction to thesis writing.

**613. Literature of Communications.** (2:2:0) Prerequisite: Comms. 610.

Study and discussion of literature that contributes to the understanding and functioning of communications processes, whatever their origin.

**615. Propaganda, Public Opinion, and Communications.** (3:3:0)

Roles of the mass media as channels of propaganda and influences upon public opinion. Effects of public opinion on mass communications.

**617. Mass Communications and Government.** (3:3:0) Prerequisite: Comms. 307 or Pol. Sci. 361 or 363.

An examination of the contemporary relationship between government and the mass media, with attention to the philosophical and historical basis for regulation in light of constitutional guarantees.

**620. Instructional Telecommunication Design.** (2:2:0) Prerequisite: consent of instructor.

Design, implementation, and evaluation of instructional telecommunication packages.

**690. Seminar in Mass Communications.** (1:1:0)

**691R. Special Studies in Communication.** (1-3:Arr.:Arr. ea.)

Individual work on approved problems not leading to a thesis. Projects must be approved before registration.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Computer Science

**Professor.** Carlson.

**Associate Professors.** Beus, Crandall, Dean (chairman, 222 TMCB), Gardner, Hays, Norman.

**Assistant Professors.** Ashton, Burton, Call.

**Program.** Master of Science (M.S.).

**Entrance Examination Required.** Graduate Record Examination.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Science

**Prerequisites.** A bachelor's degree in computer science or equivalent course work in related undergraduate programs.

**Fields.** Formal languages and automata theory, information systems, machine organization, programming systems, theory of computation.

**Minors Permissible.** Option I or Option II as explained in this catalog.

**Requirements.** Minimum of 24 semester hours plus thesis (6 semester hours).

**Required Courses.** None (No graduate credit is given for courses numbered less than 400).

**Examination.** Degree candidates must pass a written and/or oral examination covering their graduate studies. Depending on his choice of courses, a graduate can continue towards a Ph.D. in computer science or enter employment in the field of his interest.

### Courses

**501R. Advanced Topics in Computer Science.** (3:3:1 ea.) Prerequisite: consent of instructor.

Recent developments in computer science.

**505. Computers and Society.** (2:2:0) Prerequisite: senior or graduate status in Computer Science.

Study of the beneficial and adverse impacts upon society of existing and potential uses of computers.

**510. Formal Languages and Syntactic Analysis.** (3:3:0) Prerequisite: Comput. Sci. 431 or consent of instructor.

Definition of formal grammars and algorithms for syntactic analysis.

**531. Compiler Theory and Design.** (3:3:1) Prerequisites: Comput. Sci. 431 and 432.

Study and creation in theory and design of compilers and interpreters, including syntax-directed compilers and metacompilers.

**551. Data-Based Computer Systems.** (3:3:0) Prerequisite: Comput. Sci. 351.

Study of data bases and data-base management, including: design and evaluation, retrieval languages and systems, information-structuring techniques, and data integrity.

**552. Computer Center Management and Performance Measurement.** (3:3:2) Prerequisite: senior or graduate standing in computer science.

Measurement of computer systems using hard and

software monitors. Use of monitor information in systems improvement and future design. Implications for computer center management.

**555. Computer Graphics.** (3:2:1) Prerequisite: Comput. Sci. 431.

Study of computer-graphics techniques developed in recent years, including interactive graphics, graphics systems design, two- and three-dimensional picture drawing and display processors.

**561. Theoretical Foundations of Computer Science.** (3:3:1) Prerequisite: Math. 210 or equivalent.

Study of formal languages, automata theory, sequential machines, computability and undecidability, and graph theory.

☐ **Psychology 570. Computer Use in the Behavioral Sciences.** (3:3:6)

**571. Discrete System Simulation.** (3:3:1) Prerequisites: Psych. 570 or Comput. Sci. 231 or 330; Stat. 221.

Computer simulation utilizing logical, numerical, and Monte Carlo models. Collection and evaluation of statistics on passage times, flow volume, queue lengths, manpower, and equipment utilization.

**572. Artificial Intelligence and Heuristic Programming.** (3:3:0) Prerequisites: Comput. Sci. 330 or 231; Stat. 221.

Heuristic vs. algorithmic methods; description of cognitive processes; approaches to mathematical invention. Survey of research in theorem proving, game playing, simulation of cognitive processes, etc.

**581. Advanced Computer Architecture.** (3:3:3) Prerequisites: Comput. Sci. 380, Comput. Sci. 224 recommended.

Lecture, discussion, and projects leading to the ability to synthesize innovative and relevant machine organizations.

**598. Special Projects.** (1-3:1:0) Prerequisites: Comput. Sci. 351 and consent of instructor.

**699. Thesis for Master's Degree.** (Arr.:Arr.:Arr.) Prerequisite: consent of committee chairman.

## Economics

**Professors.** Clark (chairman, 302 JKB), Davies (graduate coordinator, 304 JKB), Doxey, Nelson.

**Associate Professors.** Case, Dutton, McDonald, Rickenbach, Wimmer.

**Assistant Professors.** Koller, Parsons, Pope, Pritchett.

**Program.** Master of Science (M.S.).

**Field.** Economics (with emphasis in Ph.D. preparation, junior college teaching and general degree).

**Entrance Examination Required.** Graduate Record Examination (GRE) with advanced examination in economics. International students from non-English-speaking countries must take the TOEFL or Michigan tests in English. Students may be required to take special placement examinations in the prerequisite subject matter areas.

**Application Consideration Dates.** As received until June 15 for Fall Semester, November 1 for Winter Semester, February 25 for Spring Term, and May 1 for Summer Term.

**Entry Times.** Any regular registration.

### Master of Science

**Prerequisites.** 6 semester hours of intermediate economic theory; 3 semester hours in principles of statistics, and an introductory calculus course. (D credit is not acceptable); English proficiency.

There are three master's programs. Courses listed below and taken as an undergraduate cannot be repeated for credit, but another course must be substituted.

#### Program I - Ph.D. Preparation

**Minors Permissible.** Option II only.

**Requirements.** 33 semester hours, major research paper, final written and/or oral examinations.

**Required Courses.** Econ. 510, 511, 588, 589R; one of the following two series: Stat. 433, 434, or 520, 521; one of the following: Math. 385 or 243.

#### Program 2 - Junior College Teaching

**Minors Permissible.** Normally a continuation of undergraduate minor or major; Option II.

**Requirements.** 35 semester hours, major research paper, final written and/or oral examinations.

**Required Courses.** Econ. 330 or 574, 510, 511, 515; Ed. 640, 642, 644, or a secondary teaching certificate.

#### Program 3 - General Degree

**Minors Permissible.** Option I or Option II.

**Requirements.** 24 semester hours plus thesis, final written and/or oral examinations.

**Required Courses.** Econ. 510, 511, 515, 588.

#### Courses

**501R. Current Economic Policies and Problems.** (2-3:Arr.:Arr. ea.)

**510. Advanced Price Theory.** (3:3:0) Prerequisites: Econ. 310 or 300 and completion of/or concurrent registration in either Econ. 389 or Math. 142 or 214.

Crawford, McDonald, Wimmer, Pope

**511. Advanced Theory of Income, Employment, and the Price Level.** (3:3:0) Prerequisites: Econ. 310 or 300, 311 or 301 and completion of/or concurrent registration in Econ. 389 or Math. 142 or 214.

Crawford, Dutton, Israelsen, McDonald, Nanto, Wimmer

**513R. Topics in Advanced Economic Theory.** (3:3:0 ea.) Prerequisites: Econ. 510 and 311 or 301. Israelsen, Nanto

**515. Advanced History of Economic Thought.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301.

Clark, Wimmer

**530. Advanced Economic Development.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301.

Koller, Nanto

**535R. Economic Problems of Selected Areas.** (3-6:Arr.:Arr. ea.) Prerequisites: Econ. 310 or 300 and 311 or 301.

The following areas will be considered: economics of the Soviet Union and Eastern Europe, economics of Asia, economics of Latin America, economics of Western Europe.

**541. Advanced Comparative Economic Systems.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301.

Israelsen

**552. Urban Economics, Theory Problems and Policies.** (3:3:0) Prerequisites: Econ. 110 or equivalent.

Case, Nelson, Rickenbach

**553. Theory of Money and Banking.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301. Dutton, Parsons

**558. Theory of International Trade and Finance.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301.

Doxey, Israelsen

**563. Economics of the Labor Market.** (3:3:0) Prerequisites: 310 or 300 and 311 or 301. Crawford, Davies



**564. Advanced Labor Relations.** (2:2:0) Prerequisites: Econ. 361 or consent of instructor.

**574. American Economic Development.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301.

Pritchett, Wimmer, Pope

**575. Theory of Public Finance.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301. Parsons, Pritchett, Rickenbach

**576. Industrial Organization and Public Policy.** (3:3:0) Prerequisites: Econ. 310 or 300.

Koller

**588. Econometrics.** (3:3:0) Prerequisites: Econ. 310 or 300, 311 or 301, 388 and 389 or Math. 142 or 214.

McDonald

**589R. Advanced Mathematical Economics.** (3-6:Arr.:Arr. ea.) Prerequisites: Econ. 310 or 300, 311 or 301, and Econ. 389 or Math. 142 or 214 or consent of instructor.

Pritchett, McDonald

**594R. Seminars in Selected Economics Topics.** (2-6:Arr.:Arr. ea.) Prerequisites: Completion of a 300- or 500-level course in the same subject area as the seminar.

Seminars will be held in such areas as economic theory, economic history and thought, economic development and comparative systems, monetary and banking theory and policy, urban studies.

**595R. Lectures in Economics.** (1-3:Arr.:Arr. ea.) Prerequisites: Econ. 110 or equivalent or consent of instructor.

**596R. Readings in Economics.** (1-3:Arr.:Arr. ea.) Prerequisites: Econ. 110 or equivalent or consent of instructor.

**597R. Research in Economics.** (1-3:Arr.:Arr. ea.) Prerequisites: Econ. 110 or equivalent or consent of instructor.

**664. Advanced Collective Bargaining.** (2-3 hours) Davies

**688. Applied Econometrics.** (3:3:0) Prerequisites: Econ. 310 or 300 and 311 or 301 or Bus. Man. 610 and 620 and consent of instructor.

Crawford, McDonald

**699. Thesis for Master's Degree** (6-9:Arr.:Arr.)

## Education

### Educational Administration

**Professors.** Burrup, Cottrell, Heaton, Oakes, Ovard, Smith (chairman, 207-A MCKB), Van Alfen.

**Associate Professors.** Hyatt, Rogers, Stephens, Wasden.

**Programs.** Master of Education (M.Ed.), Educational Specialist (Ed.Sp.), Doctor of Education (Ed.D.).

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Education

**Prerequisites.** A valid teaching credential and a minimum of one year of teaching experience.

**Entrance Examination Required.** Graduate Record Examination (Aptitude Test).

**Fields.** Community school administration, elementary school administration, secondary school administration.

**Minors Permissible.** Any approved minor; Option II.

**Requirements.** Minimum of 36-39 semester hours (including a minimum of 8 semester hours outside the

Department of Educational Administration) and an internship.

**Residence.** At least two full-time registrations (8 hours) must be taken on the Brigham Young University campus.

**Final Examination.** A final written comprehensive examination covering course work will be administered during the final semester of work leading to the Master of Education degree.

**Required Courses.** Consult departmental announcement.

This program is designed to prepare public school administrators for state certification at the elementary and secondary levels and to prepare community school administrators.

### Educational Specialist

**Prerequisites.** Students seeking admission to the educational specialist program must present evidence of a valid teaching credential, completion of at least two years of teaching or administrative experience, and a master's degree.

**Entrance Examinations Required.** Graduate Record Examinations (Aptitude and Advanced Test in Education).

**Fields.** Community school administration, public school administration, supervision.

**Academic and Residence Requirements.** The Educational Specialist Program requires 60 semester hours of work beyond the baccalaureate degree. Programs are designed to meet the requirements of the Utah State Board of Education for state endorsements to the Professional Certificate. Twenty-four semester hours and three full-time registrations (8 hours) must be completed on the University campus. Advisory committees, appointed following admission to the program, will assist students in the preparation of a course of study.

**Credit for Previous Work.** Credit earned in a recognized master's degree program may be applied toward the total credit hour requirement for the Educational Specialist.

**Research Requirement.** All students must demonstrate competency in educational research. Such competency is to be demonstrated in the design, implementation, and final written report of a professional educational project conducted on-site at the candidate's place of employment.

**Final Examination.** A final oral and written examination covering all course work will be administered during the final semester of work leading to the Educational Specialist.

**Required Courses.** Consult departmental announcement.

This program is designed to prepare public school administrators for state certification at the school district level and to prepare community school administrators.

### Doctor of Education

**Prerequisites.** A valid teaching credential, a minimum of three years of professional experience in education, and a master's degree.

**Entrance Examinations Required.** Graduate Record Examinations (Aptitude and Advanced Test in Education).

**Fields.** Community college administration, community school administration, public school administration.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 75 semester hours; proficiency in statistics; and a dissertation.

**Residence.** At least two consecutive full-time summer sessions must be taken on the Brigham Young University campus, with an intervening supervised field experience of 5 semester hours for each of two semesters (this option open to practitioners enrolled in special programs)

or two consecutive fulltime semesters on the Brigham Young University following admission to the program.

**Credit for Previous Work.** Credit earned in a recognized master's degree or Educational Specialist program may be applied toward the total credit hour requirement for the doctorate.

**Required Courses.** Consult departmental announcement.

This program is designed to prepare public school administrators for service at the elementary, secondary, and community college levels, and for community school administration.

## Educational Psychology

**Professors.** Bauer, Black, Downing, Harris, B. Harrison, Jensen, Kelly, Low, Merrill, Newman, Rohde, Van Mondfrans.

**Associate Professors.** Bingham, Chamberlain, Crandell, Faust, Gale (chairman, 180 CHLC), Goodman, G. Harrison, Heaps, Hendrix, Johnson, Peterson, Schneider, Snow, Thomas, Weaver, Williams, Winward, Wootton.

**Assistant Professors.** Brown, Buckner, Green, Hammond, Kay, Wadham, Walton.

**Programs.** Master of Education (M.Ed.), Master of Arts (M.A.), Educational Specialist (Ed.Sp.), Doctor of Education (Ed.D.), Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** Graduate Record Examination (verbal, quantitative, and advanced tests in education or psychology) and other area tests as determined by area of study.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Fall and Summer only. School psychology majors, Fall Semester only.

## Master of Education

**Prerequisites.** A valid teaching credential and/or appropriate professional experience as determined by major area of study.

**Fields.** Communicative disorders, counseling and guidance, educational psychology, instructional media, school psychology (interdepartmental), special education.

**Minors Permissible.** Any approved minor; Option II.

**Requirements.** Minimum of 36 semester hours (including a minimum of 8 semester hours outside the major area of study); a written and/or oral comprehensive examination may be required.

**Residence.** At least one full-time registration must be taken on the Brigham Young University campus.

**Credit for Previous Work.** Credit earned in compliance with state certification or renewal requirements must be evaluated and approved by the student's sponsor in order to be applied toward the total credit hour requirement for the Master of Education degree.

**Required Courses.** Consult department.

## Master of Arts

**Prerequisites.** A valid teaching credential and/or appropriate professional experience as determined by major area of study.

**Fields.** Communicative disorders, counseling and guidance, educational psychology, instructional media, school psychology (interdepartmental), special education.

A minor in instructional psychology is available.

**Minors Permissible.** Any approved minor; Option II.

**Requirements.** Minimum of 27 semester hours plus thesis (6-hr. min.—699).

**Residence.** At least one full-time registration must be taken on the Brigham Young University campus.

**Credit for Previous Work.** Credit earned in compliance with state certification or renewal requirements must be evaluated and approved by the student's sponsor in order to be applied toward the total credit hour requirements for the Master of Arts Degree.

**Required Courses.** Consult department.

## Educational Specialist

**Prerequisites.** A valid teaching credential and/or a minimum of two years of appropriate professional experience, as determined by major area of study, and a master's degree.

**Fields.** Counseling and guidance, special education.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 66 semester hours (including a minimum of 10 semester hours outside the major area of study; competency in research as demonstrated by completion of a professional education project.

**Residence.** At least two full-time registrations must be completed on the Brigham Young University campus.

**Required Courses.** Consult department.

## Doctor of Education

**Prerequisites.** A valid teaching credential and/or a minimum of three years of appropriate professional experience as determined by major area of study, and a master's degree or the equivalent.

**Fields.** Counseling and guidance, educational psychology, special education.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 75 semester hours; proficiency in statistics; a dissertation (12-hr. min.—Ed. 799).

**Residence.** Two consecutive full-time semesters on the Brigham Young University campus beyond the master's degree; or, as part of an approved intern-program, two consecutive full-time summer sessions on the Brigham Young University campus with intervening supervised field experience.

**Required Courses.** Consult department.

## Doctor of Philosophy

**Prerequisites.** A master's degree in education or psychology or the equivalent.

**Fields.** Counseling and guidance, educational psychology, instructional psychology, special education. A minor in instructional psychology is available.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 24 semester hours plus dissertation (18-hr. min.—799); satisfaction of tool subject prerequisites. Proficiency in statistics.

**Required Courses.** Consult department.

## Elementary Education

**Professors.** R. Allred, Berryessa, Clark, Daines, Harmon, Sucher (chairman, 205 MCKB).



**Associate Professors.** Bishop, Cutler, Dunn, Harms, Moore, Ord, Puckett, Winterrose, Young.

**Assistant Professors.** Anderson, Campbell, Wade.

**Programs.** Master of Education (M.Ed.), Master of Arts (M.A.), Sixth-Year Specialist (Ed.Sp.), Doctor of Education (Ed.D.).

**Entrance Examination Required.** Graduate Record Examination (aptitude and advanced test in education).

**Application Consideration Dates.** Same as Graduate School deadlines for Summer Term.

**Entry Time.** Summer Term only on master's degree programs.

### Master of Education

**Prerequisites.** A valid elementary teaching credential. The Reading Specialist degree requires three years of professional education prior to graduation.

**Fields.** Elementary curriculum and instruction, reading specialist.

**Minors Permissible.** Option I, any approved minor; Option II.

**Requirements.** Minimum of 36 semester hours; either a written or an oral comprehensive examination.

**Residence.** At least one full-time summer or semester registration must be taken on the Brigham Young University campus.

**Credit for Previous Work.** Up to 10 hours of credit can be applied toward a Master of Education degree. This credit must be evaluated and approved by the student's advisory committee.

**Required Courses.** Consult departmental brochure, available in 201 MCKB.

### Master of Arts

**Prerequisite.** A valid elementary teaching credential. The Reading Specialist degree requires three years of professional education prior to graduation.

**Fields.** Elementary curriculum and instruction, reading specialist.

**Minors Permissible.** Option I, any approved minor; Option II.

**Requirements.** Minimum of 33 semester hours; a final oral examination.

**Residence.** At least one full-time summer or semester registration must be taken on the Brigham Young University campus.

**Credit for Previous Work.** Up to 10 hours of credit can be applied toward a Master of Arts degree. This credit must be evaluated and approved by the student's advisory committee.

**Required Courses.** Consult departmental brochure, available in 201 MCKB.

### Sixth-Year Specialist

**Prerequisites.** A valid elementary teaching credential, a minimum of two years of teaching experience, and a master's degree.

**Fields.** Elementary curriculum and instruction, reading specialist.

**Minors Permissible.** Any approved minor; Option II.

**Requirements.** Minimum of 60 semester hours (including

a minimum of 10 semester hours outside the College of Education); a field project (6-hr. min.—699).

**Residence.** At least two full-time consecutive semester registrations must be completed on the Brigham Young University campus.

**Credit for Previous Work.** Credit applied toward a Sixth-Year Specialist degree must be evaluated and approved by the student's advisory committee.

**Required Courses.** Consult departmental brochure, available in 201 MCKB.

### Doctor of Education

**Prerequisites.** A valid elementary teaching credential, a minimum of three years of professional education experience, and a master's degree.

**Field.** Elementary curriculum and instruction.

**Minors Permissible.** Any approved minor, Option II.

**Requirements.** Minimum of 75 semester hours (including a minimum 12 semester hours outside the College of Education); proficiency in statistics; a field study (12-hr. min.—Ed. 799).

**Residence.** Two consecutive full-time semesters on the Brigham Young University campus beyond the master's degree.

**Credit for Previous Work.** Credit applied toward a Doctor of Education degree must be evaluated and approved by the student's advisory committee.

**Required Courses.** Consult departmental brochure, available in 201 MCKB.

### Secondary Education and Foundations

**Professors.** Alley, Baird, Belt, Holder, Wilcox, Wolfgramm. **Associate Professors.** Allred (chairman, 111 MCKB), Muse, Shute.

**Assistant Professors.** Coombs, Grossen, Webb.

**Programs.** Master of Education (M.Ed.), Sixth-Year Specialist (Ed.Sp.), Doctor of Education (Ed.D.).

**Entrance Examination Required.** Graduate Record Examination (aptitude and advanced test in education).

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Education

**Prerequisite.** A valid secondary teaching credential.

**Fields.** Comparative and international education, secondary curriculum and instruction.

**Minors Permissible.** Any approved minor; Option II.

**Requirements.** Minimum of 36 semester hours (including a minimum of 8 semester hours outside the Department of Secondary Education and Foundations); a written comprehensive examination and/or an oral comprehensive examination.

**Residence.** At least one full-time registration must be taken on the Brigham Young University campus.

**Credit for Previous Work.** Transfer credit will be evaluated by the department from an official transcript in determining equivalency and relevancy. This includes credit earned in compliance with state certification or renewal requirements.

**Required Courses.** Consult departmental brochure.

## Sixth-Year Specialist

**Prerequisites.** A valid secondary teaching credential, a minimum of two years of successful teaching experience, and a master's degree.

**Field.** Secondary curriculum and instruction.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 60 semester hours (including a minimum of 10 semester hours outside the College of Education); a field project (6-hr. min.—699).

**Residence.** At least two full-time registrations must be completed on the Brigham Young University campus.

**Credit for Previous Work.** Transfer credit will be evaluated by the department from an official transcript in determining equivalency and relevancy. This includes credit earned in compliance with state certification or renewal requirements.

**Required Courses.** Consult departmental brochure.

## Doctor of Education

**Prerequisites.** A valid secondary teaching credential, a minimum of two years of successful professional education experience, and a master's degree.

**Field.** Secondary curriculum and instruction.

**Minor.** Any approved minor.

**Requirements.** Minimum of 75 semester hours (including a minimum of 12 semester hours outside the Department of Secondary Education and Foundations); proficiency in statistics; a dissertation (12-hr. min.—798).

**Residence.** At least two consecutive full-time summer sessions must be taken on the Brigham Young University campus, with an intervening supervised field experience of 5 semester hours for each of two semesters; or two consecutive full-time semesters on the Brigham Young University campus beyond the master's degree, as determined by the advisory committee.

**Required Courses.** Consult departmental brochure.

## Courses

**500. Adult Education.** (3:3:0) Prerequisite: student teaching, teaching certificate, or departmental approval.

**506. Educational Media in the School.** (3:2:3) Prerequisite: Ed. 406.

Overview of the media field with emphasis on instructional applications.

**509. Selection and Utilization of Instructional Media.** (2:2:0) Prerequisite: Ed. 506.

Principle of selection, evaluation, and utilization of instructional materials. Examination of variety of "helps" to effective selection and utilization.

**510. Media Production Techniques.** (2:1:3) Prerequisite: Ed. 506.

An in-depth exploration of the various tools and techniques appropriate to the production of instructional materials.

**514R. Special Topics in Education.** (1-3:1-3:1 ea.)

**520. Photography in Instruction.** (2:1:3) Prerequisites: Ed. 506; Comms. 263 or equivalent.

The processes, techniques, and equipment applicable to the preparation of photographic instructional materials.

**524. Art and Graphic Processes in Instruction.** (3:2:3) Prerequisite: Ed. 506 or consent of instructor.

Preparation of instructional materials or reproduction masters using art and graphic processes.

**526. Instructional Use of Audio Programs.** (2:1:3) Prerequisite: Ed. 509.

Design, development, and utilization of audio materials and systems for large- and small-group and individual learning.

**527. Readiness and Beginning Reading.** (2:2:0) Prerequisite: Ed. 400 or teaching certificate.

**533. Kindergarten Education.** (2:2:0) Prerequisites: CDFR 321, Ed. 400, or teaching certificate.

**534. Innovative Practices in the Elementary School.** (3:3:1)

**536. Secondary Curriculum Methods.** (3:3:0)

Analysis of differences among the various curriculum and instructional patterns, emphasizing their impact on individualized learning.

**547. Foundations in Reading K-12.** (3:3:0) Prerequisite: teaching certificate or consent of instructor.

**550. Counseling and Guidance Services.** (2:2:0)

Principles and practices of pupil personnel services in the public schools.

**560. Educational Tests and Measurements.** (3:3:0) Prerequisite: Ed. 403R or equivalent.

Principles of test construction and use. Interpretation of standardized tests.

**562R. Curriculum for the Visually Handicapped.** (1-4: Arr.:Arr. ea.) Prerequisites: Ed. 362, 373.

Problems confronting administrator and teacher in the different types of school programs now available for the visually handicapped. Specialized teaching methods and materials.

**565. Education of Emotionally Handicapped Children.** (3:3:1) Prerequisites: Ed. 260 and consent of instructor.

Organization of educational programs, curricular development, and teaching methods for students with emotional problems.

**568R. Directed Observation in the Schools.** (2:1:4 ea.) Prerequisite: consent of instructor.

**570R. Special Education: Graduate Core.** (1-3:Arr.:Arr. ea.) Prerequisite: graduate standing.

Sections to include psychosocial educational implications of physical, mental, and social disabilities; behavioral science foundations for special education; and basic concepts in the evaluation of individual differences in exceptional children.

**573. Workshop for Teachers of Bilingual Children.** (2:8 hrs./day for 2 weeks)

Study of educational needs, materials, and methods appropriate to the background and language problems of bilingual students.

**578R. Practicum in Teaching.** (1-4:Arr.:Arr. ea.)

An application for a specific assignment must be filed with the Student Teaching Office one semester before receiving an assignment. A laboratory fee of \$25 is charged, payable upon application for student teaching.

**581R. Proseminar in Instructional Psychology.** (3:3:0) Prerequisite: consent of coordinator.

An interdisciplinary survey of topics in instructional psychology. Lectures by several different faculty members.

**585. The Community School.** (2:2:1)

Basic concepts of the community school, including history, organization, funding, leadership, facilities, and value to the community.

**600. Research Design in Education.** (3:3:0) Prerequisite: graduate standing.

**601. Comparative Current Educational Philosophy.** (3:3:0)



**602. Methods and Problems of Research in Communication Disorders. (2:2:0)**

A practical study of methods of scientific inquiry as applied to the disorders of communication. It is imperative that students take this course early in their graduate program to prepare them for their thesis projects.

**603. Educational Classics and Contemporary Issues. (3:3:0)****604. Seminar in the Generation and Perception of Acoustic Stimuli. (2:2:0)**

An advanced study made of the acoustics of speech sounds and their perception by the ear and mind of the listener. Current research in experimental phonetics reviewed.

**605. Community School Administration. (2:2:0)**

Analysis of administrative problems related to leadership, organization, finance, legal aspects, and public relations.

**606. History of Education in Europe and America. (4:4:0)****607. Education in a World Setting. (2:2:0)****608. Social Foundations of Education. (3:3:0)****609. Anatomy and Physiology of Human Communication. (2:2:0) Prerequisites: Zool. 105, 261, 262.**

Emphasis is given to the study of the anatomy and physiology related to the processes of communication including hearing, symbolization, respiration, phonation, and articulation.

**610. Designing and Producing Instructional Materials. (2:2:1) Prerequisites: Ed. 510, Psych. 460, and one of the following: Ed. 520, 524, or 526; or consent of instructor.**

Designing and producing instructional media kits or projects.

**611. Coordination of Educational Media. (2:2:0) Prerequisite: Ed. 509.**

Examination of the principles and practices in administering materials, equipment, and people in the utilization of educational media in a variety of educational settings and levels.

**612R. Supervision of Student Teachers. (1-3:Arr.:Arr. ea.) Prerequisite: teaching certificate.****614. Aphasia. (2:2:1)**

Nature, etiology, diagnosis, and therapy associated with the speech of child and adult aphasics (brain damaged) will be studied; also linguistic, behavioral, and intellectual changes.

**615. Disorders of Articulation. (2:2:2) Prerequisite: undergraduate major in communicative habilitation or speech pathology.**

An analysis of the disorders of articulation. Systems of evaluation and correction.

**616. Stuttering. (2:2:1)**

Evaluation and treatment of stuttering are studied. Its development and current theories of etiology are also reviewed.

**617. Voice Disorders. (2:2:1)**

Emphasis is placed upon the organic voice disorders. Etiological factors are identified. Diagnosis and treatment procedures are studied, and practical demonstrations are given.

**618. Communication Disorders of the Cerebral Palsied. (2:2:1) Prerequisite: 609.**

Study of the incidence, etiology, appraisal, and procedures for speech and hearing therapy of the cerebral palsied.

**619. Oro-Facial Communication Disorders. (2:2:1)**

Study of communication disorders associated with anomalies of palate, teeth, tongue, maxilla, mandible.

**620R. Master's Admission Seminar. (1-3:2:2 ea.) Prerequisite: provisional admission to the master's degree.****621. Communication Disorders of the Mentally Retarded. (2:2:1)**

Advanced studies of the communication disorders of the mentally retarded. Principles and procedures of communication habilitation. Designed for speech and hearing and special education majors and other school specialists.

**622. Advanced Study in Childhood Education. (2:2:0)**

Prerequisite: teaching certificate.

Educational theory and analysis of current practices in schools, as related to the significance and problems of early childhood education.

**623. Teaching Science in the Elementary School. (2:2:0)**

Prerequisite: teaching certificate.

**624. Dynamics of Human Communication. (2:2:0)**

A study of the dynamics of intra- and interpersonal communication. The human factors of personality, learning, motivation, cognition, etc., are considered from the perspective of human communication.

**625. Teaching Social Studies in the Elementary School. (2:2:0) Prerequisite: teaching certificate.****626R. Special Problems in Communicative Disorders. (1-3:1-3:0 ea.) Prerequisite: consent of instructor.**

Individual study in the clinical or applied areas.

**627. Teaching Reading in the Curriculum. (2:2:0) Prerequisite: teaching certificate or consent of instructor.**

Reading in the different content areas. Study of comprehension and study skills as developed in kindergarten through grade twelve.

**628. Children's Literature. (2:2:0) Prerequisite: Ed. 340.****629. Clinical Audiology. (2:2:2)**

The theoretical basis and development of skill in the techniques of administering new and advanced audiometric procedures in the assessment of impaired hearing.

**630. Community and Industrial Audiology. (2:2:1)**

Study of hearing problems in industry, legal implications, hearing, testing of adults, and adult hearing rehabilitation.

**631. Curriculum Development in the Elementary School. (3:3:0)**

Principles and procedures for organizing the instructional patterns of curriculum organizations; techniques for change, evaluation, and stabilization of curriculum.

**632. Research and Literature in Reading. (2:2:0) Prerequisites: Ed. 547 and 627.**

Study of the history of reading, with emphasis on the research and current literature in the teaching of reading from kindergarten through grade twelve. Offered Summer 1975 and alternate years.

**633. Teaching Language Arts in the Elementary School. (2:2:0) Prerequisite: teaching certificate.**

Modern methods of instruction in listening, speaking, and writing, with their related skills.

**634. Pediatric Audiology. (2:2:1)**

Intensive study of the problems encountered, the rationale behind, and the audiological instruments used in assessing the hearing of infants and young children.

**635. Teaching Mathematics in the Elementary School. (2:2:0) Prerequisite: Ed. 350 (mathematics) or equivalent.**

Analysis and evaluation of research and innovations in elementary school mathematics, with some attention to the development of enrichment materials.

**636. Secondary Curriculum and Methods: Design. (3:3:0) Prerequisite: Ed. 536.****637. Organization and Supervision of Reading Programs K-12. (2:2:0) Prerequisites: Ed. 547, 627.**

**638. Hearing Aids and Instrumentation.** (2:2:0)

Designed to acquaint students in speech, hearing, and related fields with basic designs, operation, selection, and use of hearing aids of all types for individuals with impaired hearing.

**639. History, Education, and Guidance of the Hearing Impaired.** (2:2:0) Prerequisites: Ed. 130, 260.**640. The Community College.** (3:3:0)**641. Aural Rehabilitation.** (2:2:2) Prerequisites: Ed. 130, 231.**642. Methods of College Instruction.** (3:3:0)**644R. Directed Teaching in College.** (1-4:4:0) Prerequisite: Ed. 642.

A course designed to assist students to become skilled teachers at the two-year and four-year college level, to participate as a member of a college staff and to prepare for employment at a collegiate institution.

**645. Guidance Testing and Diagnosis.** (3:3:0) Prerequisite: Ed. 550.

Study of advantages and disadvantages of particular types of tests; practice in interpreting test results; implications of test choices and usage.

**646. Counseling Theory and Practice.** (3:3:0) Prerequisite: Ed. 550.

Includes an intensive study of the various theories of counseling, important concepts and views of counseling authorities, current research, and accepted practices.

**647. Group Techniques for Counselors.** (3:3:0) Prerequisite: Ed. 646.

Principles of group guidance and their application.

**648. Laboratory in Counseling Practice.** (1:0:2) Prerequisite: completion of, or concurrent registration in, Ed. 550, 646.

Laboratory and field experiences in counseling techniques and procedures.

**651. Informational Services in Guidance.** (3:2:2-4) Prerequisite: Ed. 550.

Techniques and theories of vocation selection and utilization of community resources, occupational data, and psychological factors underlying career choices.

**652. Organization of Guidance.** (2:2:0) Prerequisite: Ed. 550.

Procedures of organizing and administering guidance programs.

**653. Student Personnel Services in Higher Education.** (2:2:0) Prerequisite: Ed. 550.**654. Elementary School Guidance.** (2:2:0)

An intensive consideration of the problems of conducting a guidance program in the elementary school.

**655. Laboratory for Guidance Services.** (1:0:2) Prerequisite: completion of, or concurrent registration in, Ed. 652.

Laboratory and field experiences in the organization and administration of guidance services.

**656. Advanced Educational Psychology.** (3:3:1) Prerequisite: Ed. 403R.**657. Behavior Problems in the Schools.** (2:2:0) Prerequisite: Ed. 403R.

Study of mental hygiene principles and their application to typical classroom problems.

**658. Evaluation and Criterion Assignment.** (3:2:1) Recommended: Psych. 378 or 678 or Ed. 560.

Models, evaluation principles, and methods of assessing criteria.

**659. Basic Principles of Instructional Psychology.** (3:3:2) Prerequisite: Psych. 460 or equivalent.

Basic principles of instructional development and their

application to the design, development, and evaluation of instructional systems.

**660. Research Design and Technical Writing in Education.** (3:3:0) Prerequisite: Stat. 552.

A study of research techniques and designs in the field of education.

**661. Experimental Research in Instructional Psychology.** (3:2:4) Prerequisite: Stat. 554 or 501; or Psych. 670.

Review of experimental literature and the design and execution of an experimental study.

**662R, 663R. Advanced Topics in Special Education.** (1-3:Arr.:Arr. ea.) Prerequisite: Ed. 570R.

Sections to include Mental Retardation, Learning Disabilities, Visually Handicapped, Emotionally Disturbed, and Curriculum Planning.

**664R, 665R. Learning Disabilities.** (2:1:2 ea.) Prerequisite: Ed. 570R.

Diagnostic teaching, prescriptive teaching, psycholinguistics, sensory motor, and perception.

**666. Special Education Services in Public Schools.** (2:2:0) Prerequisite: Ed. 570R.

Problems of organization, administration, and supervision of special education services in the public schools.

**667. Diagnosis of Achievement Difficulties.** (3:2:2) Prerequisite: consent of instructor.

Survey and use of diagnostic techniques in identification and evaluation of achievement difficulties.

**668. Remedial Teaching Techniques.** (3:2:2) Prerequisites: Ed. 667 and consent of instructor.

Procedures and materials appropriate for remediation of achievement difficulties, with major emphasis in reading.

**669. Guidance and Counseling for the Handicapped.** (2:2:0) Prerequisite: Ed. 260.

Principles and techniques of guidance services for the physically, mentally, or socially handicapped, with study of effective counseling techniques. Required for California certification.

**673R. Practicum in Educational Psychology.** (2-4:1-2:4-8 ea.) Prerequisite: consent of instructor.

Sections to include counseling and guidance, school psychology, remedial teaching, special education, and instructional media.

**674. Advanced Seminar in Special Education.** (1-3:Arr.:Arr.) Prerequisite: Ed. 570R.**675. Organization and Administration of Public Schools.** (3:3:0) Prerequisite: graduate standing.

An introduction to the principles, practices, and procedures in modern public school administration.

**677. Public School Finance.** (3:3:0) Prerequisite: Ed. 675.

The theory, principles, and general practices of public school finances.

**678. Elementary School Administration.** (3:3:0) Prerequisite: Ed. 675.

Understanding the leadership role of the principal in organizing and adapting the elementary school program to the educational needs of youth.

**679. Secondary School Administration.** (3:3:0) Prerequisite: Ed. 675.

Understanding the leadership role of the principal in organizing and adapting the secondary school program to the educational needs of youth.

**680R. Internship in Education.** (2-6:0:6-18 ea.) Prerequisite: consent of instructor eight weeks in advance of registration.**681R. Internship Practicum in Speech Pathology.** (1-2:0:4 ea.)



**682. The Teacher and School Administration.** (2:2:0) Prerequisite: Ed. 678 or 679.

**683R. Internship Practicum in Audiology.** (1-2:0:4 ea.)

**684R. Graduate Practicum in Audiology.** (1-2:0:1-2 ea.) Practice in audiological testing and instrumentation. Must be taken concurrently with either Ed. 629 or 638.

**685. Supervision of Education.** (3:3:0) Prerequisite: Ed. 675.

The principles of supervision, curriculum, planning, and in-service training in the improvement of instruction.

**687. School Law.** (2:2:0) Prerequisite: Ed. 675.

**690R. Seminar.** (2:2:0 ea.) Prerequisite: consent of instructor.

**691. Doctoral Admission Seminar.** (2:2:0 ea.) Prerequisite: permission of department.

**693R. Independent Readings.** (1-5:Arr.:Arr. ea.) Prerequisite: consent of instructor.

**696R. Independent Research.** (1-4:Arr.:Arr. ea.) Prerequisite: consent of instructor.

**698R. Field Project.** (2-4:Arr.:Arr.) Prerequisites: Stat. 552 and Ed. 600 or equivalent.

**699R. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**709. Educational Planning and Decision Process.** (3:2:2)

**712. Media in Instructional Systems.** (3:3:0) Prerequisite: Ed. 509.

An advanced course in the application of instructional media design and selection principles to the instructional development process.

**727. Curriculum of the Public Schools.** (2:2:0)

**731. Systems Analysis and Research Development Management.** (3:3:0) Prerequisite: Comput. Sci. 131 or equivalent.

Use of systems analysis to manage complex operations. Techniques for planning, budgeting, and organizing research and development; and managing complex instructional systems.

**740. Advanced Counseling Theory.** (2:2:0) Prerequisites: Ed. 646; Psych. 550.

**741. Practicum in Counseling.** (3:1:8) Prerequisite: consent of instructor.

Experience in counseling in a center. Open only to advanced doctoral students.

**751. Research Design for Doctoral Dissertation.** (2:2:4) Prerequisite: doctoral candidacy and Stat. 552 or equivalent.

**760R. Contemporary Problems of School Administration.** (2:2:0) Prerequisite: Ed. 678 or 679.

**765. Business Administration of the Public School.** (2:2:0) Prerequisite: Ed. 677.

**768. Leadership in Educational Administration.** (3:3:0) Prerequisite: 675.

A study of developmental leadership theory, group processes, concepts, and strategies essential to successful administration leadership, with opportunity for some leadership experience.

**769. School-Community Relations.** (2:2:0) Prerequisite: Ed. 675.

**770. Administration of Continuing Education.** (2:2:0)

**771. Community College Administration.** (2:2:0) Prerequisite: Ed. 640.

A study of the organizational structure and administration of the junior college.

**772. Community College Curriculum.** (2:2:0) Prerequisite: Ed. 640.

An examination of developmental, transfer, occupational, general, and continuing education.

**773. Public School Building Programs.** (3:3:0) Prerequisite: Ed. 677 and 687.

**775. Theory in Educational Administration.** (2:2:0) Prerequisite: Ed. 675.

**780R. Internship in Education.** (2-8:0:6-24 ea.) Prerequisite: consent of instructor eight weeks in advance of registration.

**790R. Seminar.** (2:2:0 ea.) Prerequisite: consent of instructor.

**796R. Advanced Research.** (2-4:Arr.:Arr. ea.) Prerequisite: consent of instructor.

**799R. Dissertation.** (Arr.) Prerequisite: Ed. 751 or equivalent.

## Engineering Sciences

### Ph.D. Program in Engineering

**Executive Committee.** Hanks (chairman, 350-G ESTB), Heaton, Durrant, Humpherys.

The Ph.D. program in engineering is an interdepartmental program administered by an executive committee of the engineering faculty. The course work offered in this program is listed separately under each of the four participating engineering departments (Chemical, Civil, Electrical, and Mechanical). The faculty consists of the graduate faculty of the four engineering departments.

The master's programs in engineering are administered by each department separately but are coordinated with the Ph.D. program for those who wish to continue beyond the master's level.

**Program.** Doctor of Philosophy (Ph.D.).

**Entrance Examination Required.** Qualifying examination.

The student should contact the chairman of the Executive Committee for details.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Doctor of Philosophy

**Prerequisites.** B.S., BES, or M.S. degree in engineering or the equivalent. Tool preparation: satisfactory completion of any one of the following:

Tool Requirement I

Tool Requirement II

Tool Requirement III, consisting of any one of the following:

1. Stat. 501 (5) plus any one of Stat. 337 (3), 502 (5), 531 (3), or 534 (3)
2. Stat. 421 (3) plus Stat. 501 (5)
3. Stat. 321 (3) or 332 (2), Stat. 421 (3), plus any one of Stat. 422 (3), 432 (3), 433 (3), or 541 (3)
4. Comput. Sci. 231 (3) and 580 (4)

Tool Requirement IV, consisting of 21 semester hours of mathematics (beyond and excluding Math. III or its equivalent) and/or computer science in any combination.

**Fields.** Chemical Engineering: Combustion, environmental control, fluid mechanics (with Mechanical Engineering), nuclear engineering (with Physics), thermodynamics.

**Civil Engineering:** Highway and geotechnical engineering, structures and structural mechanics, water resources and environmental engineering.

**Electrical Engineering:** Communications engineering, computer engineering, power engineering, solid-state electronics.

**Mechanical Engineering:** Applied mechanics, machine design, manufacturing, nuclear engineering (with Physics), thermosciences.

**Requirements.** Approximately 50 hours beyond bachelor's degree, plus dissertation (18-hr. min.—799); 18 hours must be minor; 12 semester hours of the minor in advanced mathematics in addition to tool requirements unless waived by committee.

## Chemical Engineering Science

**Distinguished Professor.** Hall.

**Professors.** Barker, Christensen, Coates, Hanks (graduate coordinator, 350-G ESTB), Horton, Pope, Smoot (chairman, 350-F ESTB).

**Associate Professors.** Glassett, Jackson, Wilson.

**Assistant Professor.** Bartholomew.

**Programs.** Master of Engineering (M.E.), Master of Science (M.S.). (Students anticipating doctoral work in this area see "Doctor of Philosophy" above.)

**Entrance Examinations Required.** U.S. citizens: none. Foreign nationals: Graduate Record Examination (verbal, aptitude, and advanced engineering). At the department's discretion, a special entrance screening examination may be required.

**Application Consideration Dates.** U.S. citizens: as received. Foreign nationals: April 1 each year.

**Entry Times.** U.S. citizens (M.E., M.S., or Ph.D.), foreign nationals having M.S. degree and seeking Ph.D.: any semester or term. Foreign nationals (master's level): Fall Semester only.

## Master of Engineering

This degree is designed to provide advanced engineering training at the master's level with emphasis on management, design, and synthesis. This is partly accomplished by choice of courses and partly by the special project (3 hrs., 698R). Because no research project or thesis is required, the student does not receive special training for research work. Students desiring such training should consider the M.S. or Ph.D. programs.

**Prerequisites.** B.S. degree (or equivalent) in chemical engineering from an AIChE-accredited school. B.S. degree in other engineering, chemistry, physics, materials science, or metallurgy is acceptable for provisional admission. Consult departmental brochure for further details.

**Fields.** Applied mathematics, bioengineering, combustion, environmental engineering, fluid mechanics, nuclear engineering, plant management, process engineering, thermodynamics.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 30 semester hours including special project (3 hr. min.—698R).

**Required Courses.** Chem. Eng. 673 (3), 675 (3), 677 (1), 681 (3), 691R (1—each semester), 698R (3 min.), Options/Minor (16-18).

For requirements for the Option/Minor special programs, see departmental brochure.

## Master of Science

**Prerequisites.** B.S. degree (or equivalent) in chemical engineering from an AIChE-accredited school. B.S. de-

gree in other engineering, chemistry, or physics is acceptable for provisional admission. Consult departmental brochure for further details.

**Fields.** Applied mathematics, catalysis, combustion, environmental control, fluid mechanics, nuclear engineering, thermodynamics.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699R).

**Required Courses.** Chem. Eng. 673 (3), 675 (3), 677 (1), 681 (3), 691R (1—each semester).

For requirements of special programs, see departmental brochure.

## Courses

**510. Energy and Fossil Fuels.** (3:3:0) Prerequisite: concurrent registration in Chem. Eng. 464 or special permission.

Energy sources and demands; energy processes, costs, and relation to environment; design applications and case studies, with emphasis on coal gasification and shale oil recovery.

**520. Air Pollution Control.** (3:3:0) Prerequisite: concurrent registration in Chem. Eng. 464 or special permission.

Investigation of causes and effects of air pollution; standards, criteria and legislation; dispersion, meteorology and atmospheric chemistry. Includes design project and use of impact statements.

**550. Process Synthesis and Control.** (3:3:0) Prerequisites: Math. 321, Chem. Eng. 376.

Measurement and control of process variables. The characteristics of controllers, measuring elementary and application of closed loops.

**582. Introductory Nuclear Engineering.** (3:3:0) Prerequisites: Chem. 106 or 112; Math. 214; Physics 221.

Barker, Jackson

Principles and application of nuclear reactor design.

**583. Nuclear Engineering.** (2:2:0) Prerequisite: Chem. Eng. 582.

Barker, Jackson

Reactor design, including reactor physics, heat transfer, engineering materials, instrumentation, and control.

**672. Advanced Fluid Mechanics and Rheology.** (3:3:0) Prerequisites: Math. 645; Chem. Eng. 673.

Hanks

Proper formulation of constitutive equations; non-Newtonian flow, stability, turbulence, drag reduction, nonisothermal flow, and heat transfer. Offered on demand.

**673. Transport Phenomena.** (3:3:0) Prerequisites: Chem. Eng. 476; Math. 323.

Hanks, Smoot

General differential equations of conservation of mass, heat, and momentum; transport coefficients; turbulent flow; interphase transfer, etc.

**674. Advanced Thermodynamics and Calorimetry.** (2:2:0) Prerequisite: Chem. 561.

Christensen

Advanced thermochemistry, including application to measurement of heats of mixing, heat of reaction, equilibrium constant, etc. Offered on demand.

**675. Thermodynamics of Multicomponent Systems.** (3:3:0) Prerequisite: Chem. 561.

Christensen, Hanks, Wilson

Thermodynamic analysis of nonideal multicomponent solutions; prediction of activities and fugacities; thermodynamic consistency of data; development of correlating equations. Offered on demand.

**676. Advanced Diffusional Operations.** (3:3:0) Prerequisites: Chem. Eng. 673; Chem. 561; Math. 323.

Pope, Wilson

General theory of differential and stagewise diffusional and separations operations; multicomponent distillation extraction, absorption; solution of complex



problems; column design and instrumentation. Offered on demand.

**677. Creative Skills in Chemical Engineering.** (1:1:0)  
Barker, Horton, Jackson  
Application of creativity and prior course work to the solution of relevant open-end problems.

**681. Kinetics and Catalysis.** (3:3:0) Prerequisite: Chem. Eng. 478. Bartholomew, Horton, Pope  
Application of fundamental theories of chemical kinetics and transport phenomena to the design of chemical reactors.

**683. Advanced Plant Design and Economics.** (2:2:0) Prerequisite: Chem. Eng. 464. Glassett, Pope  
Comprehensive design of chemical plants including feasibility and market surveys, economic evaluations, raw materials, plant layout, process design, instrumentation, materials of construction. Offered on demand.

**691R. Seminar for Master's Students.** (1:1:0 ea.)  
Technical presentations by graduate students, faculty members, and invited guests.

**693R. Special Topics—Graduate.** (1-3:Arr.:Arr. ea.)  
Investigation of topics of special interest. Offered on demand.

**698R. Special Problems—Graduate.** (2-6:0:0 ea.)

**699R. Thesis for Master's Degree.** (Arr.:Arr.:Arr.)

☐ **Chemistry 769. Selected Topics in Physical Chemistry.** (1-3:1-3:0)

**791R. Seminar for Doctoral Students.** (1:1:0 ea.)

**793R. Selected Topics in Chemical Engineering.** (1-3: Arr.:Arr. ea.)

Courses taught in this class will be based on research interest of faculty and students and will include such courses as kinetics and transport in reacting multicomponent flow systems with application to complex reactor systems, free jets, particle laden stream, plasmas, etc. Offered on demand.

**799R. Dissertation for Doctoral Students.** (Arr.)

## Civil Engineering Science

**Professors.** C. Barton, J. Barton (chairman, 368 ESTB), Budge, Christiansen, Firmage, Fuhrman, Karren, Rollins, Stutz.

**Associate Professors.** Durrant (graduate coordinator, 368-B ESTB), Merritt, Wilson.

**Programs.** Master of Science (M.S.), Master of Engineering (M.E.). (Students anticipating doctoral work in this area are referred to page 62 for details.)

**Entrance Examination Required.** Graduate Record Examination required for applicants from non-ECPD (Engineers' Council for Professional Development) accredited schools.

**Application Consideration Dates.** May 1 for Fall Semester; same as Graduate School deadlines for other semester and terms.

**Entry Times.** Any regular registration.

## Master of Science

**Prerequisites.** A bachelor's degree in civil engineering or its equivalent. (Students with other backgrounds will also be considered.)

**Fields.** Highway and geotechnical engineering, structures and structural mechanics, water resources and environmental engineering.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 25 semester hours plus thesis Civ. Eng. 699 (6-hr. min.).

**Required Course.** Civ. Eng. 691R (1).

## Master of Engineering

**Prerequisite.** A bachelor's degree in civil engineering or its equivalent. (Students with other backgrounds will also be considered.)

**Fields.** Highway and geotechnical engineering, structures and structural mechanics, water resources and environmental engineering.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 28 semester hours plus a project Civ. Eng. 698 (3-hr. min.).

**Required Course.** Civ. Eng. 691R (1).

## Courses

**501. Advanced Mechanics of Materials.** (3:3:0) Prerequisite: Civ. Eng. 303.

Introduction to strain energy methods; stresses and strains in beams, curved members, beams on elastic foundations, thick cylinders, and torsion and structural members.

**502. Advanced Properties of Materials.** (3:3:0) Prerequisite: Civ. Eng. 305 or equivalent.

Mechanics of deformation and fracture of solids; mechanical behavior of materials correlated with atomic scale mechanisms; creep, residual stresses, and fatigue.

**503. Applied Elasticity.** (3:3:0) Prerequisites: Civ. Eng. 303; Math. 321.

Analysis of stress and strain; equations of equilibrium and compatibility; generalized Hooke's Law; energy theorems.

**505. Concrete—Its Materials, Uses, and Properties.** (3:2:3) Prerequisite: consent of instructor.

Manufacture and testing of cements; concrete materials and concrete mix design; techniques of concrete handling, placing, and treatment; laboratory work.

**507. Experimental Stress Analysis.** (3:2:3) Prerequisite: Civ. Eng. 303.

Experimental methods of stress determination and their application to static engineering problems. Mechanical gages; brittle lacquers; electric resistance strain gages; photoelasticity and photostress techniques.

**513. Photogrammetry.** (3:2:3) Prerequisite: Civ. Eng. 212.

Use of terrestrial and aerial photographs to produce maps; vertical and oblique photography and mapping procedures; stereoscopic viewing and measurements for relative position of objects in three dimensions; photo interpretation; sources of errors.

**527. Matrix Methods in Structures.** (3:2:3) Prerequisite: Civ. Eng. 422.

Development of the stiffness and flexibility methods of structural analysis using linear algebra and the digital computer.

**528. Finite Element Analysis.** (3:3:0) Prerequisite: Civ. Eng. 527 or consent of instructor.

Development of finite elements for an elastic continuum; applications using matrix algebra; consideration of plates, shells, and frameworks using the digital computer.

**531. Water Resources Engineering.** (3:2:3) Prerequisites: Civ. Eng. 431, 432.

Principles of planning and basic design of hydroelectric, flood control, irrigation, drainage, and multipurpose projects involving the utilization of water resources.

**550. Water Quality Management.** (3:3:0) Prerequisite: consent of instructor.

Philosophies, objectives, and methods of water quality management; impact of various uses on water quality; behavior of pollutants in receiving waters.

**555. Sanitary Engineering Analysis.** (3:1:6) Prerequisites: Civ. Eng. 451; Micro. 381; or equivalent.

Analytical techniques involved in chemical and biological analysis of the major organic and inorganic constituents of water, sewage, and industrial wastes.

**561. Highway Design.** (3:3:0) Prerequisite: Civ. Eng. 461.

Theory and practice in highway design. Highway classification, design controls, and criteria. Location studies; design of vertical and horizontal alignment, cross-section, pavement, drainage, intersections, and interchanges. Multilane facilities.

**610. Theory and Design of Plates.** (3:3:0) Prerequisite: Civ. Eng. 303.

Theory and analysis of thin plates of moderate thickness; membrane theory; anisotropic considerations.

**612. Structural Stability.** (3:3:0) Prerequisite: Civ. Eng. 303.

Elastic and inelastic buckling of columns; analysis of beam columns; torsional-flexural buckling, and buckling of thin plates and cylindrical shells.

**615. Structural Dynamics.** (3:3:0) Prerequisite: Civ. Eng. 304.

The study of free and forced, damped and undamped, lumped parameter, and multiple-degree-of-freedom linear structures. Approximate methods for nonlinear structures; applications to frameworks and beams.

**620. Advanced Structures—Theory and Design.** (3:3:0) Prerequisite: Civ. Eng. 422.

Advanced topics in structural theory and design: arches, frames, continuous structures on elastic supports, plastic design theory.

**621. Thin Shell Structures.** (3:3:0) Prerequisites: Civ. Eng. 422, 424.

Theory and design methods related to domes, arches, solid plate, and hyper structures.

**622. Design of Bridge Structures.** (3:2:3) Prerequisites: Civ. Eng. 341, 422, 423, 424.

Design of bridge structures: floor systems, composite and continuous beams and girders, trusses, piers, and abutments.

**623. Prestressed Concrete.** (3:3:0) Prerequisites: Civ. Eng. 422, 424.

Basic theory of prestressed concrete, pre- and post-tensioning methods. Details of design and fabrication; applications to continuous structures.

**625. Design of Multistory Structures.** (3:2:3) Prerequisites: Civ. Eng. 341, 422, 423, 424, or consent of instructor.

Shear walls, floors, columns, frames, and foundations, using elastic and plastic methods. Frame response to lateral forces.

**632. Advanced Hydrology.** (3:3:0) Prerequisites: Civ. Eng. 431, 432 or equivalent.

Theory and application of advanced hydrologic principles to engineering design and investigations.

**633. Hydraulic Design of Water Control Structures.** (3:3:0) Prerequisite: Civ. Eng. 432.

Principles of design of dams and appurtenant works and other water-control structures.

**634. Flow in Open Channels.** (3:3:0) Prerequisite: Civ. Eng. 332.

Principles of water flow in artificial and natural open channels, and application to practical problems.

**641. Advanced Soil Mechanics.** (3:3:0) Prerequisites: Civ. Eng. 341, 442 or equivalent.

Advanced topics in soil mechanics including stress distribution in earth masses, the shearing strength of soils, consolidation theory, settlement analysis, stability of slopes, and the bearing capacity of soils.

**643. Earth- and Rock-Fill Structures.** (3:3:0) Prerequisite: Civ. Eng. 341 or equivalent.

Design and construction of earth- and rock-fill dams; selection of dam-sites; selection of materials; seepage and pore pressure studies; shearing strength data; stability analysis; construction controls.

**644. Advanced Foundation Engineering.** (3:3:0) Prerequisite: Civ. Eng. 641.

Foundation engineering techniques of subsurface investigation, determination of the allowable soil pressures for footings; design of spread footings; raft formation; pile foundation.

**646. Flow of Fluids through Porous Media.** (3:3:0) Prerequisites: Civ. Eng. 332, 341.

Fluid flow in saturated and unsaturated anisotropic media. Darcy's Law and Navier-Stokes equations. Potential theory and conformal mapping; analog solutions.

**652. Design of Water Treatment Works.** (3:3:0) Prerequisite: Civ. Eng. 555 or equivalent.

Water purification and treatment for culinary, municipal, and industrial uses.

**653. Design of Sewage Treatment Works.** (3:3:0) Prerequisite: Civ. Eng. 451 or equivalent.

Design of sewage disposal and treatment works.

**654. Industrial Waste Treatment.** (3:3:0) Prerequisites: Civ. Eng. 451, 555, or equivalent.

Treatment and disposal of industrial wastes; studies of basic industries and their waste problems.

**661. Traffic Engineering—Theory of Flow and Geometric Design.** (3:3:0) Prerequisite: Civ. Eng. 461 or equivalent.

Characteristics of motor-vehicle traffic; theory of traffic flow; freeway operations and traffic regulations; design of highways and parking facilities, at-grade intersections, interchanges, channelizations, parking lots and garages.

**663. Pavement Design.** (3:3:0) Prerequisite: Civ. Eng. 461 or equivalent.

Properties and selection of pavement components, including soils, stabilized soil, base, subbase, subgrade, and bituminous materials. Design of rigid and flexible pavements.

**691R. Civil Engineering Seminar.** ( $\frac{1}{2}$ :1:0 ea.)

**694R. Selected Problems in Civil Engineering.** (1-3:Arr.: Arr. ea.)

**697R. Research in Civil Engineering.** (2:Arr.:Arr. ea.)

**698R. Directed Studies in Civil Engineering.** (Arr.) Prerequisite: consent of instructor and/or Master's Graduate committee.

Investigation, study, and presentation of a technical engineering report in an area of civil engineering. The project must be approved by the graduate committee.

**699. Thesis for Master's Degree.** (Arr.)

**794R. Selected Topics in Civil Engineering.** (1-3:Arr.: Arr. ea.)

**797R. Research for Doctoral Students.** (Arr. ea.)

**799. Dissertation for Doctoral Students.** (Arr.)

## Electrical Engineering Science

**Professors.** Berrett, Clegg, Humphreys (graduate coordinator, 458 ESTB); Jonsson, Losee (chairman, 459 ESTB), Woodbury.



**Associate Professors.** Bowman, Chaston, Miner.

**Assistant Professor.** Bearson.

**Programs.** Master of Science (M.S.), Master of Engineering (M.E.). (Students anticipating doctoral work in this area are referred to page 62 for details.)

**Entrance Examinations Required.** None, unless the undergraduate school is not accredited; then the student must submit results of the Graduate Record Examination (advanced test in engineering).

**Application Consideration Dates.** June 30 and Nov. 15.

**Entry Times.** Any regular registration.

## Master of Science

**Prerequisites.** B. S. degree in electrical engineering from a recognized school (accredited by the Engineers' Council for Professional Development); or, with the consent of the department, a B.S. degree in an allied discipline. With a non-E.E. degree remedial work will generally be required.

**Fields.** Communication engineering, computer engineering, power engineering, solid-state electronics.

**Minors Permissible.** Option II only.

**Requirements.** Minimum of 24 semester hours (including 6 hours in mathematics and/or statistics) plus thesis (6-hr. min.—699).

**Required Courses.** The following courses are normally required for the areas of specialization indicated:

### Computer

Elec. Eng. 513  
Elec. Eng. 521  
Elec. Eng. 525  
Elec. Eng. 526  
Elec. Eng. 529

Other Courses from Math, Computer Science and Elec. Engineering

### Power Systems

Elec. Eng. 513  
Elec. Eng. 531  
ChE 582  
Elec. Eng. 532R  
Elec. Eng. 533  
Elec. Eng. 360  
Elec. Eng. 537R

### Solid-State Electronics

Elec. Eng. 513  
Elec. Eng. 550  
Elec. Eng. 552R  
Elec. Eng. 551  
Elec. Eng. 560  
Elec. Eng. 645

### Communications

Elec. Eng. 513  
Elec. Eng. 560  
Elec. Eng. 664  
Elec. Eng. 561  
Elec. Eng. 566  
Elec. Eng. 665

## Master of Engineering

**Prerequisites.** B.S. degree at a recognized school (accredited by the Engineers' Council for Professional Development). If the school is not accredited, the student must submit results of the Graduate Record Examination (advanced test in engineering).

**Fields.** Communication engineering, computer engineering, power engineering, solid-state electronics.

**Minors Permissible.** Option II only.

**Requirements.** 27 semester hours (including 6 hours in mathematics and/or statistics) plus a project (3-hr. min.—697R).

**Required Courses.** See listing under Master of Science for each field of interest.

## Courses

**411. Feedback Concepts.** (3:3:0) Prerequisites: Civ. Eng. 304; Math. 321; either Elec. Eng. 302 or 431; 304 or 341. Jonsson

**431. Electrical Energy Conversion.** (4:3:3) Prerequisite: Elec. Eng. 311.

Magnetic circuits, transformers, and energy conversion principles.

**442. Electronic Circuits and Devices 2.** (4:3:3) Prerequisite: Elec. Eng. 341.

**450. Electrical Properties of Materials.** (3:2:3) Prerequisites: Elec. Eng. 360, 442. Woodbury

**513. Linear Systems.** (3:3:0) Prerequisite: consent of instructor.

State-space and transform techniques in the analysis of linear systems.

**521. Computer Arithmetic Techniques and Microprogramming.** (3:3:0) Prerequisite: Elec. Eng. 320.

**523. Digital Computer Design.** (3:3:0) Prerequisite: Elec. Eng. 210.

The operation and logical design of digital computers.

**524. Switching Theory.** (3:3:0) Prerequisite: Elec. Eng. 523.

Analysis and synthesis of combinatorial and sequential switching circuits; their use in computation.

**525. Advanced Switching and Logic Theory.** (3:3:0) Prerequisite: Elec. Eng. 320.

Fault diagnosis, multi-ports, advanced algorithms, computer-aided digital system design, and iterative networks.

**526. Computer Communication Systems.** (3:3:0) Prerequisites: Elec. Eng. 320, 442.

Computer networks, I/O handling, digital data transmission techniques, synchronization, error coding, feedback communications, decision theory, likelihood, correlation, and orthogonal signals.

**528. Analog Computer Design.** (3:3:0) Prerequisite: Elec. Eng. 304 or 442.

Theory and operation of analog computer components; hybrid computation.

**529. Computer Graphics and Real-Time Programming.** (3:3:0) Prerequisite: Elec. Eng. 320.

Graphic input/output systems for digital computers; on-line and real-time hybrid systems.

**531. Power Systems Analysis.** (3:3:0) Prerequisite: Elec. Eng. 302 or completion of or concurrent registration in Elec. Eng. 431.

Polyphase circuits, transmission line constants, power system representation, generalized circuit constants, symmetrical components, and fault studies.

**532R. Special Topics in Power Systems.** (3:3:0) Prerequisite: Elec. Eng. 531.

**533. Power Machinery and Equipment.** (3:3:0) Prerequisite: Elec. Eng. 302 or 431.

Transformers; synchronous, induction, and DC machines; other power system devices.

**537R. Advanced Control Machinery Laboratory.** (1:0:3) Prerequisite: Elec. Eng. 411.

Experiments with electrical machinery, control systems, and power distribution systems.

**541. Switching, Timing, and Pulse Circuits.** (4:3:3) Prerequisite: Elec. Eng. 341.

Passive and active electronic circuits, with emphasis on nonlinear modes of operation.

**542. Advanced Switching and Pulse Circuits.** (3:3:0) Prerequisite: Elec. Eng. 541.

Switching, shaping, memory, and function generation in electronic systems.

**550, 551. Physical Electronics.** (3:3:0 ea.) Prerequisite: Physics 221. Recommended: Elec. Eng. 450.

Theory and applications of solid-state electronic devices, including Gunn and avalanche diodes, lasers, and magnetic and acoustical devices.

**552R. Semiconductor Laboratory.** (1-2:0:3-6 ea.) Prerequisite: completion of or concurrent registration in Elec. Eng. 450 or 550.

Experimental investigation of semiconductor materials, including basic measurements and construction of electronic devices.

**560. Electromagnetic Engineering.** (3:3:0) Prerequisites: Elec. Eng. 360; concurrent registration in Elec. Eng. 567.

Application of electromagnetic field theory to microwave components and systems.

**561. Communication Circuits.** (3:3:0) Prerequisites: Elec. Eng. 360, 442; concurrent registration in Elec. Eng. 566.

Circuits and RF techniques used in communication systems.

**564. Radar Systems.** (3:3:0) Prerequisites: Elec. Eng. 360, 442.

Major components constituting a radar, and development of system engineering concepts.

**566. Communication Circuits Laboratory.** (2:0:6) Prerequisite: concurrent registration in Elec. Eng. 561.

Building and testing the circuits studied in Elec. Eng. 561.

**567. Microwave Laboratory.** (1:0:3) Prerequisite: concurrent registration in Elec. Eng. 560.

Building and testing microwave systems studied in Elec. Eng. 560.

**593R. Special Topics in Electrical Engineering.** (3:3:0 ea.) Prerequisite: consent of instructor.

Content varies from year to year. Recent developments in electrical engineering.

**598R. Special Problems.** (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.

**623. Advanced Digital Computers.** (3:3:0) Prerequisites: Elec. Eng. 523; Comput. Sci. 232 or equivalent.

Advanced theory and operation of digital computers and their design and application to engineering, scientific, and control problems.

**645. Microwave Devices.** (3:3:0) Prerequisite: Elec. Eng. 560.

Theory and design of passive and active microwave components.

**661. Advanced Electromagnetic Fields.** (3:3:0) Prerequisite: Elec. Eng. 560.

Physical interpretation of electromagnetic fields. Mathematical methods of solving boundary value and other field problems.

**663. Antenna Theory.** (3:3:0) Prerequisite: Elec. Eng. 360.

An advanced viewpoint of radiation, terminal, and distributed properties of antenna structures.

**664, 665. Communication Theory.** (3:3:0 ea.) Prerequisite: consent of instructor.

Transmission through electric networks; periodic sampling; pulse modulation, analysis of information transmission systems; noise considerations.

**697R. Master of Engineering Project.** (3:Arr.:Arr. ea.) Prerequisite: consent of major professor.

One-semester project for Master of Engineering degree.

**698R. Readings and Seminar.** (1:1:0 ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Prerequisite: consent of major professor.

**791R. Seminar for Doctoral Students.** (1:1:0 ea.)

**794R. Selected Topics in Electrical Engineering.** (1-3:Arr.:Arr.)

**797R. Research for Doctoral Students.** (Arr. ea.)

**799. Dissertation for Doctoral Students.** (Arr.)

## Mechanical Engineering Science

**Professors.** Andersen, Cannon, Free, Heaton (graduate coordinator, 242-D ESTB), Polve, Simonsen (chairman, 242-C ESTB), Ulrich, Warner, Wille.

**Associate Professors.** Chase, Paxson.

**Assistant Professor.** Woolley

**Programs.** Master of Science (M.S.), Master of Engineering (M.E.). (Students anticipating doctoral work in this area are referred to page 62 for details.)

**Entrance Examinations Required.** No special exams required of graduates of ECPD (Engineers' Council for Professional Development) accredited schools. Favorable consideration given to graduates of curriculums not accredited by ECPD who submit Graduate Record Examination scores in aptitude and advanced engineering tests. Also, for non-ECPD curriculum graduates, a screening exam is required after arrival to determine weaknesses that must be strengthened.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Engineering

**Prerequisites.** Bachelor's degree in mechanical engineering or, with the consent of the department, an allied discipline.

**Fields.** Applied mechanics, machine design, manufacturing, nuclear engineering, thermosciences.

**Minors Permissible.** Option I and Option II.

**Requirements.** Minimum of 30.5 semester hours including a project (3-hr. min.—698).

**Required Courses.** Mech. Eng. 510, 534, 540, 591R, Math. 322, 323, and Elec. Eng. 302, 303, or 304, 305.

This program is designed to provide the breadth of experience encountered by a practicing professional engineer. To increase flexibility in scheduling, a special program (M-3 program) is available in which a student may work on the B.S. and M.E. degrees simultaneously during the last 3 years (6 semesters). The B.S. degree may be obtained simultaneously with, or prior to, the receipt of the M.E. degree. To enter the M-3 program, the student must file an application and course outline for both B.S. and M.E. programs at the beginning of his junior year. After acceptance, a student may take courses for graduate credit. Prior to taking the last 30 hours of course work the student must apply to graduate school.

## Master of Science

**Prerequisites.** Bachelor's degree in mechanical engineering or, with the consent of the department, an allied discipline.



**Fields.** Applied mechanics, machine design, manufacturing, nuclear engineering, thermosciences.

**Minors Permissible.** Option I and Option II.

**Requirements.** Minimum of 30.5 semester hours including thesis (6-hr. min.—699R).

**Required Courses.** Mech. Eng. 591R and 6 hours of mathematics beyond the level of ordinary differential equations.

This is a research-type program designed for students who plan a research or development career in engineering.

## Courses

(See also related courses in other engineering and physical science offerings.)

☐ **Civil Engineering Science 501. Advanced Mechanics of Materials.\*** (3:3:0)

☐ **Civil Engineering Science 502. Advanced Properties of Materials.\*** (3:3:0)

**510. Fluid Mechanics 2.** (3½:3:2) Prerequisites: Math. 321; Mech. Eng. 412.

Compressible flow; shock effects; Fanno and Rayleigh lines; generalized one-dimensional flow.

**511. Intermediate Gas Dynamics.** (3:3:0) Prerequisite: Mech. Eng. 510.

Potential theory and Euler's equations. Supersonic and subsonic multidimensional flow. Method of characteristics; small perturbation theory; Hodograph theory, theoretical airfoil coefficients, etc.

**512. Boundary Layer Theory.** (3:3:0) Prerequisite: Mech. Eng. 412.

The stress tensor; Navier-Stokes equations; exact solutions for parallel flow; lubrication theory; Prandtl's equations; separation; Karman-Pohlhausen integral methods; applications.

**515. Applied Aerodynamics and Flight Mechanics.** (3:3:0) Prerequisite: Mech. Eng. 322.

An integrated picture of modern applied aerodynamics up to and including performance, stability, and control of aerospace vehicles.

**521. Energy Resources and Conversion.\*** (3:3:0) Prerequisite: Mech. Eng. 322.

Survey of energy resources and design of systems for conversion of energy using the principles of thermodynamics.

**531. Principles of Automatic Control.\*** (3:3:0) Prerequisites: Mech. Eng. 412, 534; Math. 321.

Transfer functions applied to mechanical, hydraulic, pneumatic, and electrical components and their combination. Block diagrams; Nyquist and Routh criteria; Bode's and root locus plots; integral and error rate compensation. Nonlinear systems.

**533. Stress Analysis and Design of Mechanical Structures.\*** (3:3:0) Prerequisite: Civ. Eng. 303.

Methods of predicting stress and deflection; optimization of components; applications to vehicle and aerospace structure design; curved beams and rings; semi-monocoque structures.

**534. Dynamic System Analysis and Modeling.** (3½:3:2) Prerequisites: Math. 321; Civ. Eng. 304.

Lumped models of mechanical, electrical-mechanical, fluid, and thermal systems; graphic models; physical system response; digital and analog simulation.

**535. Advanced Vibration Analysis.\*** (3:3:0) Prerequisites: Math. 321; Civ. Eng. 304.

Vibrations of systems with multiple degrees of freedom; vibrations of elastic bodies; random vibrations; simple nonlinear systems.

**537. Advanced Kinematics.\*** (3:3:0) Prerequisite: Mech. Eng. 431.

Geometry of constrained motion, with application to point paths; kinematic synthesis; types of mechanisms.

**540. Heat Transfer.** (3½:3:2) Prerequisites: Mech. Eng. 321, 412; Math. 321.

Fundamentals of heat transfer; basic laws; conduction; convection; change of phase; radiation.

**541. Advanced Heat Transfer.** (3:3:0) Prerequisite: Mech. Eng. 540.

Heat transfer analysis by numerical and analog methods. Emphasis on radiation and conduction. Use of digital and analog computers, passive analogs.

**542. Design of Heat-Transfer Systems.\*** (3:3:0) Prerequisite: Mech. Eng. 540.

Design of heat-transfer devices and heat-exchange systems associated with environmental temperature control, electronic cooling and aerospace vehicles.

**552. Design and Materials Applications.** (3:3:0) Prerequisites: Mech. Eng. 351, 454.

Applied and residual stresses; materials selection; static, impact, and fatigue strength; fatigue damage; surface treatments; elastic deflection and stability—all as applied to mechanical design.

**554. Advanced Manufacturing Processes.** (3:3:0) Prerequisite: Mech. Eng. 351 or consent of instructor.

Basic analysis of forming, machining, welding, and casting processes, with emphasis on microstructures. Selection of process parameters, with consideration of economics and material properties.

**555. Mechanical Forming Methods.\*** (3:3:0) Prerequisite: consent of instructor.

A treatment of methods for calculating forces, velocities, and other physical parameters necessary to understand and design forming equipment such as extruders and rollers.

**556. Advanced Physical Metallurgy.\*** (3:3:0) Prerequisites: Mfg. Tech. 335, Math. 223, or equivalent; or consent of instructor.

A continuation of Mfg. Tech. 335, including topics related to advanced material forming, molding, joining, and heat-treating processes.

**572. Interdisciplinary Systems Design.** (3:1:6) Prerequisite: Mech. Eng. 471.

Design projects emphasizing group project attack on contemporary problems. Interdisciplinary faculty and student participants.

**581. Internal Combustion Engines.\*** (3:2:3) Prerequisite: Mech. Eng. 322.

Basic principles of spark-ignition and compression; ignition engines; actual cycles; performance characteristics; carburetion and ignition principles; detonation and combustion. Laboratory work with three advanced engine testing cells.

**584. Design of Fluid Machinery and Propulsion Engines.** (3:3:0) Prerequisite: Mech. Eng. 412.

Design and synthesis of radial and axial flow machines, pumps, and rocket, ramjet, and turbojet engines; applications of fluid flow and thermodynamic fundamentals.

**591R. Seminar.** (½:1:0 ea.)

Student and faculty presentation of topics of special and current interest.

**593. Mechanical Engineering Practicum.** (1-3:0:0) Prerequisite: minimum of 60 hours in mechanical engineering.

Technical elective credit given in recognition of at least two months of full-time, engineer-related, industrial experience. Planning document and formal report required.

**595R. Special Topics in Mechanical Engineering.** (Arr. ea.) Prerequisite: consent of department chairman.

**611. Theories of Fluid Turbulence.\*** (3:3:0) Prerequisite: Mech. Eng. 412; Math. 322, 323.

An introductory study of fluid turbulence both theoretical and experimental, including statistical and phenomenological models and using the Reynolds convention applied to the classical flow equations.

**612. Principles of Ideal-Fluid Dynamics.\*** (3:3:0) Prerequisites: Mech. Eng. 412; Math. 322, 323.

Analytical study of ideal-fluid hydrodynamics and aerodynamics. Topics include ideal-fluid assumptions, rotational and irrotational flow, acyclic and cyclic motion, circulation and lift.

**637. Dynamics in Mechanical System Design.\*** (3:3:0) Prerequisite: Mech. Eng. 531 or 534.

Applied design analysis of complex systems needing evaluation of vibrations, transient response, and/or feedback control. Classical, modern, and computer techniques are included.

**641R. Selected Topics in Heat-Transfer Theory.\*** (3:3:0 ea.) Prerequisite: Mech. Eng. 540.

Analysis of heat transfer in conduction, convection, or radiation.

**651. Advanced Topics in Manufacturing.\*** (3:3:0) Prerequisite: Mech. Eng. 554 or consent of instructor.

Presentation and evaluation of the more advanced aspects of material behavior, forming, welding, casting, and machining.

**661. Selected Topics in Solid Mechanics.\*** (3:Arr.:Arr.) Prerequisites: Civ. Eng. 303, Math. 323.

Three-dimensional equations of elasticity specialized to engineering problems including tensor notation, wave propagation, computer solutions, and rate-dependent and inelastic materials.

**695R. Special Problems for Masters Students.** (1-3:Arr.:Arr. ea.) Prerequisite: permission of department chairman.

Selected problems in mechanical engineering.

**697R. Research.\*** (Arr. ea.)

**698. Project for Master of Engineering.** (3-5:0:Arr.) Prerequisite: fifth-year standing in mechanical engineering program.

A design or research project in support of the Master of Engineering program. To be completed in one semester.

**699R. Thesis for Master's Degree.** (6-9:Arr.:Arr. ea.)

**791R. Seminar for Doctoral Students.** (1:1:0 ea.)

**795. Selected Topics in Mechanical Engineering.** (1-3:Arr.:Arr.)

**797R. Research for Doctoral Students.** (Arr. ea.)

**799. Dissertation for Doctoral Students.** (Arr.)

\*Electives offered on demand.

## English

**Professors.** B. Clark, M. Clark, Cox, Craig (chairman, 246 JKBA), Ellsworth, Farnsworth (graduate coordinator, 242 JKBA), Gassman, Hart, Jacobs, King, Larson, R. Thomas, Thomson, West, Wood.

**Associate Professors.** Blanch, Brady, Cracraft, Evans, J. B. Harris, Lambert, McKellar, McKendrick, Tate, Thayer, J. Thomas, Waterstradt, Williams.

**Assistant Professors.** Arnold, B. Best, Esplin, Geary, Hunsaker, Luthy, Wight.

**Programs.** Master of Arts (M.A.), Doctor of Philosophy (Ph.D.).

**Entrance Examination Required.** Graduate Record Examination (verbal and advanced) or the senior comprehensive written examination of this department.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** Undergraduate major or its equivalent (including one course in literary criticism, one course in history of the language, and one course in modern grammar) and a reading knowledge of one foreign language, preferably French or German.

**Fields.** American literature, English literature, the English language.

**Minors Permissible.** Any of the three fields not selected for the major or a related area, such as modern languages, linguistics, psychology, or comparative literature.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699). One hour enrollment in English 695 each semester or term until prospectus has been filed; thereafter, one or more hours of English 699. See also English 615.

**Required Courses.** English 615; and 529, 624, or 626.

**Thesis.** A student may select any one of the following four options:

1. A thesis on a topic demanding research, criticism, or both.
2. Three long papers written in three different areas of English or American language or literature and on topics demanding research, criticism, or both.
3. Two long papers written in two different areas of English or American language or literature and on topics demanding research, criticism, or both; and a substantial creative work.
4. An extended creative project as described below. A candidate who wants to apply for this option should inform the graduate coordinator of the English Department when he begins his work for the degree. He must comply with the regulations of the English Department and the Graduate School in the same way as other candidates.

To prepare for option 3 the candidate must complete two hours of the following courses: English 315, 316, 318, 319; or, if he is a transfer student, their equivalent. To prepare for option 4 the candidate must complete at least two hours either as a graduate or undergraduate student in the English 300 writing series and at least two hours in English 518R. His average grade for the required course or courses must be at least B. He must also submit samples of his current creative writing to the Writing Committee of the English Department, who, within a two-week period, will evaluate them and will recommend acceptance or rejection of the candidate's application. When the candidate for either option has been assigned an advisory committee, the committee will approve his creative project—which may consist of such forms as essays, a drama or dramas, librettos, short stories, a novella, a novel, or poetry—to satisfy the thesis requirement.

This program is designed to prepare students for Ph.D. work in English and teaching English on the junior college level.

## Doctor of Philosophy

**Prerequisites.** A master's degree in English from an accredited graduate school. If the earlier degrees have not included formal course work in the following areas, these courses must be completed in addition to the other Ph.D. requirements: (1) "History of the English



Language" (English 421); (2) one of the following language courses: "Old English" (English 624), "Middle English" (English 626), or the "Structure of Modern English" (English 529); (3) "Bibliography and Methods of Research" (English 615); (4) "Literary Criticism" (English 351 or English 650). A reading knowledge of French and German (other languages may be substituted only with the written permission of the graduate coordinator of the English Department upon recommendation of the student's faculty sponsor).

**Fields.** American literature, English literature.

**Minors Permissible.** The field listed above not selected for the major, or a related area, such as comparative literature, history, language, linguistics, approved by the advisory committee.

**Requirements.** See competency statement of the Graduate School.

**Required Courses.** One hour enrollment in English 695 each semester or term until prospectus has been filed; thereafter, one or more hours of English 799. As arranged.

## Courses

### 500R. Eminent American Writers. (1-3:1-3:0 ea.)

Different writers are treated each semester in this series.

### 510R. Eminent English Writers. (1-3:1-3:0 ea.)

Different writers are treated each semester in this series.

### 518R. Advanced Creative Writing. (2:2:0) Prerequisite: English 318, 319, or consent of instructor.

Larson, Thayer

A seminar in the writing of fiction, poetry, drama, and the essay; individual consideration of manuscript; professional orientation. May be repeated for credit with the consent of instructor.

### 520R. Studies in Theme and Form. (2-3:2-3:0 ea.)

An intensive study of limited literary topics (the theory of myth, Gothic fiction, Utopian literature, tragic and comic modes, etc.). Varies according to instructor.

### 529. Structure of Modern English. (3:3:0) Prerequisites: English 321; Ling. 325; or consent of instructor.

Cox, Luthy

Application of the methods of linguistic science to the description of the phonology, morphology, and syntax of modern English.

### 615. Bibliography and Methods of Research. (2:2:0)

Gassman, J. Thomas

The use of library resources as tools for literary study and an introduction to various areas in which literary research may be pursued. To be taken in the first regular semester of graduate study.

### 621R. Problems in the English Language. (3:3:0 ea.) Prerequisite: English 421.

Cox, McKendrick

The study of a particular period in the English language or a particular aspect of the language, such as the study of morphology or syntax.

### 624. Old English. (3:3:0)

McKendrick

A study of Old English grammar and vocabulary in order to understand traditional syntactical patterns and to read various types of Old English prose and poetry.

### 625. Beowulf. (2:2:0) Prerequisite: English 624.

McKendrick

A close reading of the poem in the original, with emphasis upon literary and cultural values.

### 626. Middle English. (3:3:0)

McKendrick

A detailed study of the principal Middle English dialects as illustrated in the literature of the period.

### 631. The English Novel. (3:3:0) Prerequisites: English 332, 333, or consent of instructor.

Brady, B. Clark,  
Gassman

An intensive analysis of literary values and techniques in selected novels. Not a survey course.

### 635. The American Novel. (3:3:0)

Arnold, M. Clark,  
Jacobs

Various approaches to the novel with emphasis on the formal. Focus may vary according to the instructor and the needs of students.

### 641. The English Drama. (3:3:0)

Craig

A short intensive survey of English drama from its beginning, followed by independent research.

### 650. Literary Criticism. (3:3:0) Prerequisite: English 351 or equivalent.

M. Clark, Hart, Larson

An examination of modern critical theory and practice and application by students to specific literary works.

### 651R. Studies in Poetry. (3:3:0)

Hart, Larson

### 652R. Studies in Prose Nonfiction. (3:3:0)

Farnsworth,  
Hart, J. Thomas, Thomson

### 661. Colonialism and Puritanism in American Literature. (3:3:0) Prerequisite: English 361 or consent of instructor.

Jacobs, Thomson, Williams

Intensive readings in major writers of the emerging American literary and cultural traditions before 1800.

### 662. Romanticism in American Literature. (3:3:0) Prerequisite: English 361 or consent of instructor.

Ellsworth, Jacobs, Thomson

The rise and fruition of the romantic movement in American literature from Freneau to Lowell.

### 663A,B,C,D,E. Studies in Regional American Literature. (3:3:0) Prerequisite: a general background in American literature.

Cracroft, Jacobs, Lambert, Thomson

Focus on a different region each time offered.

### 664. Realism and Naturalism in American Literature. (3:3:0) Prerequisite: English 362 or consent of instructor.

M. Clark, Cracroft, Jacobs, Lambert

Dominant cultural and aesthetic trends since the Civil War.

### 666. American Literature, 1900-1950. (3:3:0) Prerequisite: at least one course in modern American literature.

M. Clark, Evans, Larson

### 667. Folklore. (2:2:0) Prerequisite: English 391 or consent of instructor.

\*Wilson

Directed study in folklore and folkways, with emphasis on the Mormon heritage and tradition. Collecting, analyzing, and editing.

### 669. Teaching English in the Secondary Schools. (2:2:0) Prerequisite: English 377 or consent of instructor.

West

Intensive consideration of literature, writing, grammar, and reading materials appropriate to English courses, and the effective use of these materials.

### 671. The Medieval Period in English Literature. (2:2:0)

McKendrick

A close reading in the original of a principal work, such as *Troilus and Criseyde*, *Piers Plowman*, or *Sir Gawain and the Green Knight*, with emphasis upon its relation to the other literature, the culture, and the history of the period.

### 672. The Renaissance in English Literature. (3:3:0) Prerequisite: English 372 or consent of instructor.

Larson,  
J. Thomas, Wood

Research in individual authors, styles, influences, and trends. Emphasis will vary according to instructor.

### 673. Classicism in English Literature. (3:3:0) Prerequisite: English 373 or consent of instructor.

Gassman, Hart

A study in depth of selected writers from the period 1660-1780.

**674. Romanticism in English Literature.** (3:3:0) Prerequisite: English 374 or consent of instructor. B. Clark, J. B. Harris

An intensive review of the major figures and trends in the romantic period (1780-1832), along with individual research.

**675. The Victorian Age in English Literature.** (3:3:0) Prerequisite: English 375 or consent of instructor. Brady, B. Clark, Farnsworth

A detailed analysis of literary genres, values, and techniques in representative works of the period. Not a survey course.

**676. British Literature, 1900-1950.** (3:3:0) Prerequisite: at least one course in modern British literature. Hart, Larson

**680. Contemporary Literature.** (3:3:0) Prerequisite: at least one course in twentieth-century literature, or consent of instructor. M. Clark, Hart, Larson

Study of specific trends in literature and criticism; students may select areas of interest.

**682. Problems in Shakespearean Scholarship and Criticism.** (3:3:0) Prerequisites: English 382, 582, or consent of instructor. Farnsworth, Hart

**695. Individual Readings in English.** (1-2:Arr.:0)

Intended for investigation beyond course work offered. One hour enrollment each semester or term required until prospectus has been filed; thereafter, one or more hours of English 699.

**699. Thesis for Master's Degree.\*** (Arr.)

See options described with master's program in English above.

**728R. Studies in Rhetoric and Style.** (3:3:0 ea.)

**799. Dissertation for the Ph.D. Degree.\*** (Arr.) Prerequisite: approval of the candidate's chairman.

\*See section of this catalog entitled "Continuous Registration."

## Food Science and Nutrition

Professor. Bennion.

Associate Professors. Hill (chairman, 2218-B, SFLC), Johnson (graduate coordinator 2218-E).

Assistant Professors. Freeman, Walker.

Program. Master of Science (M.S.).

Entrance Examinations Required. None.

Application Consideration Dates. April 1 and October 15.

Entry Times. Fall or Winter semester.

### Master of Science

**Prerequisites.** Undergraduate major in food science and nutrition or a closely related field, with basic courses in the physical and biological sciences.

**Fields.** Food science and nutrition.

**Minors Permissible.** Biochemistry recommended; other minors available in consultation with major professor; Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.); a statistics course.

**Required Courses.** Nutrition: FSN 635, 636, 637, 691; Food Science: FSN 652, 654, 656, 690.

These programs are designed to prepare students for Ph.D. work in nutrition or food science, for college teaching, and/or for positions in industry.

### Courses

**635. Protein and Amino Acid Nutrition.** (3:3:0) Prerequisite: FSN 435 or equivalent. Offered Fall semester.

**636. Energy Balance and Vitamin Nutrition.** (3:3:0) Prerequisite: FSN 435 or equivalent. Offered Winter Semester.

**637. Mineral Nutrition.** (3:3:0) Prerequisite: FSN 435 or equivalent. Offered Spring term.

**652. Carbohydrates and Their Reactions in Foods.** (3:3:0) Prerequisite: FSN 450 or equivalent.

Sugars, higher saccharides, starches, pectins, gums, hemicelluloses, and celluloses; and their derivatives: functions and reactions in foods.

**654. Proteins and Their Reactions in Foods.** (3:3:3) Prerequisite: FSN 450 or equivalent.

Plant and animal proteins, their functions and changes during food processing; food enzyme properties.

**656. Food Lipids and Their Reactions.** (3:3:3) Prerequisite: 450 or equivalent.

Lipids and their derivatives; reactions and functions in food processing.

**690. Seminar in Food Science.** (1-2:1-2:0)

**691. Seminar in Nutrition.** (1-2:1-2:0)

**697R. Research.** (1-3:Arr.:Arr. ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Geography

Professor. Layton (chairman, 167-D HGB).

Associate Professors. Grey, Hudman, Jackson, Stevens.

Program. Master of Science (M.S.).

Entrance Examination Required. Graduate Record Examination (general and advanced section on geography).

Application Consideration Dates. Same as Graduate School deadlines.

Entry Times. Any regular registration.

### Master of Science

**Prerequisites.** Undergraduate minor in geography or its equivalent. Students going into area studies should have a strong language background. Those emphasizing planning, cartography, or geography in business or industry should have background in mathematics or statistics.

**Fields.** Cartography, general geography, urban and regional planning.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699).

**Required Courses.** Geog. 601, 620, 630, 698R, 699.

This program is designed to provide a general background at the graduate level for either a terminal degree or preparation for more advanced work, and to allow specialization according to the student's specific interest in a particular area within the discipline.

### Courses

**501. Geography for Teachers.** (3:3:0)

A systematic approach to the fundamentals of geography, emphasizing source materials, teaching methods, tools, and techniques.



502R. Seminar in Regional Geography. (2:2:0 ea.)

504. Geographic Field Techniques. (2:1:2)

512. Cartography. (3:1:4) Prerequisite: Geog. 312.

520. Spatial Analysis. (3:3:0) Prerequisites: Sociol. 205 or 206 or Stat. 221.

Application of quantitative and location-allocation models to determine and account for location of economic, social, religious, and public institutions in their service regions.

522. Urban Geography. (3:3:0)

Distribution of urban areas, their development, internal land use patterns, and functions in the world's economy.

533. Industrial Geography. (3:3:0)

A systematic analysis of major industries in the United States with emphasis on planning and industrial location theory.

580. Geography of Underdeveloped Areas. (2:2:0)

Physical, economic, and human geography as it affects the world's underdeveloped areas, with emphasis on future development possibilities.

598. Seminar in Techniques of Research and Presentation. (2:2:0)

A proseminar in the scholarly use of geographical sources, leading to a substantial paper in oral and written form.

601. Physical Geography. (2:1:2)

620. Cultural Geography. (2:1:2)

630. History and Philosophy of Geography. (2:2:0)

The development of geographical thought. Major concepts concerning the nature, scope, and methodology of the discipline.

690R. Readings. (1:0:2 ea.)

695. Special Problems. (1-2:1-2:0)

698R. Seminar in Systematic Geography. (2:2:0 ea.)

A detailed investigation of selected aspects of systematic geography.

699. Thesis for Master's Degree. (6-9:Arr.:Arr.)

## Geology

**Professors.** Best (graduate coordinator, 146-B ESC), Bissell, Brimhall, Bullock, Bushman, Hamblin, Hintze, Petersen, Phillips (chairman, 275 ESC), Rigby.

**Associate Professors.** Baer, Miller.

**Programs.** Master of Science (M.S.), Master of Arts in earth sciences (M.A.), Doctor of Philosophy (Ph.D.).

**Application Requirements.** Scores on Graduate Record Examination and advanced geology.

**Entrance Requirements.** A departmental exploratory examination may be given during first week of enrollment.

**Application Consideration Dates.** Same as Graduate School deadlines. Application for teaching assistantships and other financial aid for the following school year must be received by the Geology Department before March 1.

**Entry Times.** Fall or Winter semesters only.

**Student Load Limits.** The normal load for a student who is not working is 12 hours per semester or 6 hours per term. The maximum allowable load for student teaching assistants working 20 hours a week is 10 hours

per semester. For those working 10 hours a week, the maximum credit load is 12 hours.

## Master of Science

**Prerequisite.** Undergraduate degree in physical or biological sciences. Arrangements to make up any undergraduate deficiencies will be made in consultation with the Geology Department graduate coordinator.

**Fields.** Economic geology; mineralogy, geochemistry, and petrology; paleontology; stratigraphy and sedimentation; structural and field geology.

**Minors Permissible.** Option I or II.

**Requirements.** Minimum of 24 semester hours plus a published thesis (6-hr. min.—699).

**Required Course.** Geol. 512, "Geology of North America."

## Master of Arts

**Prerequisite.** Undergraduate degree in physical or biological sciences.

**Field.** Earth science teaching emphasis.

**Minors Permissible.** Any combination of physical or biological science courses listed below.

**Requirements.** (1) a minimum of 12 hours in geology and 12 hours from the associated fields of astronomy, botany, chemistry, geography, mathematics, physics, zoology; (2) a comprehensive written examination of graduate course work prior to the thesis defense; (3) a thesis representing research work in the field of earth science under faculty adviser's supervision for a total of 6 hours; (4) a final oral examination on the research thesis.

**Required Courses.** Selections are to be made from the following courses:

Geology 507, 510, 512, 540, 577, 584, plus upper-division courses not previously taken

Botany 321, 331, 440, 455, 510, 526, 539, 550

Chemistry 351, 352, 353, 514, 598

Geography 405, 601

Mathematics 300, 301, 302, 371, 501, 502, 629

Physics 300, 527, 528, 536, 537

Zoology 321, 325, 457, 543, 545, 546, 547, 591R, 601

## Doctor of Philosophy

**Prerequisites.** Master's degree in geology or equivalent course work.

**Fields.** Economic geology; mineralogy, geochemistry, and petrology; paleontology; stratigraphy and sedimentation; structural and field geology.

**Minors Permissible.** Outside the department or fields within the department, as approved by the applicant's committee.

**Requirements.** Approved courses, demonstrated competence in research, and a dissertation (18-hr. min.—799).

**Required Course.** Geol. 512, "Geology of North America."

## Courses

411. **Geomorphology.** (3:2:2) Prerequisite: Geol. 112. Hamblin

451. **Optical Mineralogy.** (3:2:2) Prerequisite: Geol. 351. Phillips

- 460. Economic Geology.** (3:2:2) Prerequisite: Geol. 352.  
Bullock  
Mining techniques; and ore treatment. Offered 1975-76 and alternate years.
- 470. Stratigraphy and Sedimentation.** (3:2:2) Prerequisite: Geol. 325.  
Bushman
- 480. Introduction to Paleontology.** (3:2:2) Prerequisite: Geol. 112.  
Petersen
- 502. Geology for Teachers.** (2:2:0) Prerequisites: Geol. 101 and 102, or 103, or 111.  
Bushman  
Designed to aid junior and senior high school earth science teachers. Materials and methods useful for the classroom.
- 507. History of Geology.** (2:2:0)  
Bushman  
Historical development of concepts and philosophy distinctive to geology. Offered 1976-77 and alternate years.
- 510. Conducted Field Trips.** (1-3:Arr.:Arr.) Prerequisite: Geol. 101, 103, or 111.  
Visits to and explanations of a variety of geologic features spectacularly displayed in the Intermountain West. Credit varies with number and length of trips in which student participates, but, in general, 30 hours will be spent in the field for each credit hour. Maximum credit allowable is 3 hours.
- 512. Geology of North America.** (4:3:2)  
Rigby  
A region-by-region study of the areal geology, physiography, and geologic development of Canada, the United States, and Mexico.
- 515. Photogeology.** (3:1:4)  
Hintze  
Techniques useful to practicing geologists; use of parallax bar and various instruments applicable to contact print photos.
- 520. Petroleum Geology.** (4:4:0)  
Baer  
Offered 1975-76 and alternate years.
- 535. Groundwater.** (4:4:0)  
Hintze  
Offered 1976-77 and alternate years.
- 540. Plate Tectonics.** (3:3:0)  
Best  
Survey of physics of earth's interior and its bearing on plate tectonics.
- 544. Geochemistry Laboratory.** (2:1:2) Prerequisite: consent of instructor.  
Brimhall  
Use of spectroscopic instruments for acquisition of chemical and isotopic data on geological materials.
- 545. Geochemistry.** (3:3:0) Prerequisite: consent of instructor.  
Brimhall  
Geological materials and processes from a chemical point of view. Offered 1976-77 and alternate years.
- 551. Advanced Mineralogy.** (3:2:2) Prerequisites: Geol. 351 and 451; Physics 202 or 213.  
Phillips  
Crystallography, structure, and crystal chemistry of major mineral groups studied by X-ray diffraction and other methods.
- 552. Igneous and Metamorphic Petrography.** (3:1:4) Prerequisites: Geol. 352 and 451.  
Bearing of textures and mineral associations on history of rock bodies.
- 561. Ore Deposits.** (4:4:0) Prerequisite: Geol. 460.  
Bullock  
Metallic ore deposits—their origin, classification, and distribution, emphasizing major ore deposits of the United States.
- 562. Industrial Minerals and Rocks.** (3:3:0) Prerequisite: Geol. 460.  
Bullock  
Occurrence, distribution, and use of nonmetallic earth materials. Offered 1976-77 and alternate years.
- 563. Mining Geology.** (3:3:0) Prerequisite: Geol. 460.  
Bullock  
Ore search and appraisal; assembling geological data;
- 574. Principles of Stratigraphy.** (3:3:0) Prerequisite: Geol. 470.  
Bissell  
Offered 1976-77 and alternate years.
- 575. Precambrian and Paleozoic Stratigraphy.** (3:3:0)  
Hintze  
Synthesis of regional stratigraphic relations in North America. Offered 1976-77 and alternate years.
- 576. Mesozoic and Cenozoic Stratigraphy.** (3:3:0)  
North American Mesozoic and Cenozoic rocks and key fossils. Offered 1976-77 and alternate years.
- 577. Oceanography.** (3:3:0) Prerequisite: Geol. 470.  
Hamblin  
Oceanic processes, shoreline topography, sedimentary patterns, and sea floor features. Offered 1975-76 and alternate years.
- 580. Invertebrate Paleontology (Protozoans through Brachiopods).** (4:3:2)  
Rigby  
Morphology, paleoecology, evolution, and stratigraphic significance of invertebrates. Offered 1975-76 and alternate years.
- 581. Invertebrate Paleontology (Mollusks through Hemichordates).** (4:3:2)  
Petersen  
Continuation of Geol. 580. Offered 1975-76 and alternate years.
- 582. Biostratigraphy.** (3:2:2) Prerequisite: Geol. 480 or 581.  
Petersen  
Fossils in their stratigraphic setting and principles of paleontologic chronology. Offered 1975-76 and alternate years.
- 583. Palynology.** (3:2:3) Prerequisites: Bot. 105; Geol. 480.  
Bushman  
Modern and fossil palynomorphs—their preparation, identification, and application to stratigraphic and paleoecologic problems. Offered 1976-77 and alternate years.
- 591R. Seminar.** (1:1:0 ea.)
- 655. Igneous Petrology.** (4:3:2) Prerequisite: Geol. 552.  
Origin and crystallization behavior of magmas, with emphasis on crystal-liquid relations in simple experimental systems. Offered on demand.
- 656. Metamorphic Petrology.** (3:2:3) Prerequisite: Geol. 552.  
Best  
Subsolidus mineral equilibria; thermodynamic concepts; geologic variables in metamorphic systems; graphical analysis of mineral assemblages. Offered on demand.
- 670. Sedimentation and Sedimentary Tectonics.** (3:2:2)  
Bissell  
Offered 1976-77 and alternate years.
- 671. Sedimentary Petrology—Carbonate Rocks.** (3:2:2)  
Bissell  
Offered 1975-76 and alternate years.
- 672. Sedimentary Petrology—Clastic Rocks.** (3:2:2) Prerequisite: Geol. 470.  
Hamblin  
Offered 1975-76 and alternate years.
- 680. Micropaleontology.** (3:2:2) Prerequisite: Geol. 480 or 581.  
Rigby  
Geologically important microfossils, including conodonts, ostracodes, and foraminifera. Offered 1976-77 and alternate years.
- 685. Paleoecology.** (4:3:2) Prerequisite: Geol. 480 or 581.  
Rigby  
Ancient environments and ecology of major taxonomic groups. Offered 1975-76 and alternate years.
- 696. Reading and Conference in Geology.** (1-4:1-4:0)
- 697R. Directed Field Studies.** (1-6:Arr.:Arr. ea.)



698. Research. (1-4:1-4:0)

699. Thesis for Master's Degree. (6-9:Arr.:Arr.)

797R. Directed Field Studies. (1-6:Arr.:Arr. ea.)

799. Dissertation for Doctor of Philosophy Degree. (Arr.)

## Health Sciences

**Professors.** Shaw (college coordinator, 221-F RB), Watters (chairman, 213 RB).

**Associate Professors.** Burgener, Hafen, Heiner, Rhodes, Rollins, Thygerson.

**Assistant Professors.** Hurley, Salazar.

**Programs.** Master of Science (M.S.), Master of Health Education (M.H.Ed.).

**Entrance Examination Required.** None.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry times.** Any regular registration.

### Master of Science

**Prerequisites.** Community health: an undergraduate major or a minimum of 20 hours in community health courses.

Health education: an undergraduate major or minor (minimum, 20 hours or equivalent) in health science. Safety education: an undergraduate major or a minimum of 20 hours in health science and/or safety education.

**Fields.** Community health, health education (with emphasis in school health), safety education.

**Minors Permissible.** Option I or II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.); a written comprehensive coursework examination.

**Required Courses.** Community health: Health 692, 551, 670, Stat. 552.

Health education: Health 692, Stat. 552.

Safety education: Health 525, 692, Stat. 552.

### Master of Health Education

**Prerequisites.** Community health: an undergraduate major or a minimum of 20 hours in community health courses.

Health education: an undergraduate major or minor (minimum, 20 hours or equivalent) in health science. Safety education: an undergraduate major or a minimum of 20 hours in health science and/or safety education.

**Fields.** Community health, health education (with emphasis in school health), safety education.

**Minors Permissible.** Option I or II.

**Requirements.** Minimum of 32 semester hours; a written comprehensive coursework examination.

**Required Courses.** Community health: Health 692, 551, 670, Stat. 552.

Health education: Health 692, Stat. 552.

Safety education: Health 525, 692, Stat. 552.

### Courses

501R. Health Education Workshop. (1-3:Arr.:Arr. ea.)  
Watters

A presentation of selected health education problems, followed by discussions. Conducted on a workshop basis.

502R. Driver and Safety Education Workshop. (1-3:Arr.:Arr. ea.) Prerequisite: certified driver education instructor or consent of department chairman. Thygerson  
Presentation of current safety education problems, research, and methods of instruction.

503R. Health Problems Workshop. (1-3:Arr.:Arr. ea.)  
Current problems in school and community health.

525. Countermeasures for Accident Control. (2:2:0)

Thygerson  
Magnitude of the accident problem, epidemiology, role of public agencies, and evaluation of countermeasures for accidents.

□ Education 550. Introduction to Guidance Services. (2:2:0)

551. Fieldwork in Community Health. (Arr.:Arr.:Arr.)  
Recommended: Health 451. Burgener

Designed to broaden understanding of community health agencies, their roles, programs, and relationships.

□ Statistics 552. Statistical Methods in Education I. (3:3:0)

552. School Health, Organization, and Services. (2:2:0)

Shaw  
Considers desirable school health services and functions and relationships to public education and education law. Coordinates school health services with community programs.

□ Education 560. Educational Tests and Measurements. (3:3:0)

561. Health of the Body Systems. (3:3:0) Rhodes  
Advanced course in personal health, dealing with the major factors in health and disease as they involve the several body systems.

□ Physical Education 635. Research Design in Physical Education. (2:2:1)

□ Education 648. Laboratory in Counseling Practice. (1:0:2)

650. Preservation of Human Health. (3:3:0) Prerequisite: Health 451 or equivalent. Hafen

An epidemiological approach to the cause, nature, extent, and trends in the deterioration of human health.

651. Community Organization for Health. (3:3:0)

Hurley  
Nature of voluntary health organizations, current research in community school organization, and relationship of school health programs to community.

660. Body Responses to Health and Disease. (2:2:0)  
Prerequisite: Health 561 or equivalent. Rhodes

The physiology and biological chemistry of stimulants and depressants.

□ Physical Education 662. Administration and Public Relations. (3:3:0)

□ Zoology 662. Advanced Physiology I. (2:1:2)

670. Environmental Health. (2:2:0) Burgener

Emphasis on educational practices that relate to improving the environmental approach.

671. Graduate Practicum. (1:1:0) Watters

Analysis of the role and functions of the college health teacher. Supervised experience in teaching and research.

672. Social Hygiene. (2:2:0) Heiner

Designed to prepare a prospective teacher to instruct in family life education as it relates to health. Emphasis on the area of sexual maturation, family health problems, parenthood, and other social hygiene factors.

692. **Research Methods in Health Sciences.** (3:3:0) Shaw
694. **Seminar in Readings.** (2:2:0) Watters
- 696R. **Independent Studies.** (1-3:Arr.:Arr. ea.) Watters
699. **Thesis for Master's Degree.** (6-9:Arr.:Arr.)
- **Education 709. Comprehensive Planning in Education.** (3:2:2)

## History

**Professors.** Addy, Alexander (graduate coordinator, 488 HBLL), Allen, Arrington, Campbell, Hyer, Jensen, Warner (chairman, 250 MSRB).

**Associate Professors.** Britsch, Cardon, Flammer, Hill, Marlow, Tobler.

**Assistant Professors.** Chandler, Fox, Holmes, Montgomery, Pixton, Seibt, Stewart, Thorp, Wood.

**Programs.** Master of Arts (M.A.), Master of Arts for Teachers of History (M.A.), Doctor of Philosophy (Ph.D.).

**Entrance Requirements.** A grade-point average of 3.0 over the last 60 hours and satisfactory recommendations are required. In addition, those entering the M.A. for Teachers of History must be currently under a teaching contract. At least two letters of recommendation must be submitted from persons familiar with the student's academic qualifications, preferably from professors who have had him as a student. Each applicant must submit an example of his written work, such as a History 490 paper, or take the verbal portion of the Graduate Record Exam.

**Application Consideration Dates.** Same as graduate school. Applicants for graduate assistantships for Fall Semester must have applications to department by April 1.

**Entry Times.** Any regular registration.

### Master of Arts

**Prerequisites.** An undergraduate degree in history or equivalent.

**Fields.** Asia (with Asian Studies), American history, European history, Latin America (with Latin American Studies), history teacher emphasis.

**Minors Permissible.** Option I or II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699).

**Required Course.** One semester in thesis field.

### Master of Arts for Teachers of History

**Prerequisites.** An undergraduate degree in history or equivalent and a current teaching contract.

**Requirements.** Minimum of 36 hours of credit approved as follows: Graduate Education, 9 hours; History, 21 hours; Professional Education Project (PEP), 6 hours. Consult committee for specific requirements in each area.

**Required Courses.** Education 536, 636, 696R, History 500R.

### Doctor of Philosophy

**Prerequisite.** A master's degree in history or the equivalent.

## Fields.

### Group I. General Fields

- A. American history
- B. Ancient history
- C. Medieval history
- D. Modern Europe
- E. History of Asia
- F. Latin American history

### Group II. Areas of Specialization

- A. American history
  1. Colonial history to 1789
  2. U.S. national, 1783-1877
  3. U.S., 1877 to present
  4. The frontier and western America
  5. History of religion in America
- B. Ancient history
  1. Greek history
  2. Roman history
- C. Medieval history
  1. Early medieval history
  2. Later medieval history
- D. Modern Europe
  1. Renaissance and Reformation
  2. Seventeenth and eighteenth centuries
  3. Nineteenth and twentieth centuries
- E. History of Asia
  1. Ancient Asia
  2. Modern Asia
- F. Latin American History
  1. Colonial Period
  2. National Period
- G. Religious History (Secondary Field only)
  1. Christian Church History
  2. Old Testament and Ancient Near East
  3. New Testament and the Graeco-Roman World
  4. Asian Religions

**Minors Permissible.** Any approved minor.

**Requirements.** One year of study (at least 18 credit hours including a Ph.D. seminar) must be taken in residence. Competency is expected in the major field consisting of a general field selected from Group I above, plus an area of specialization from within the major field (see Group II). In addition, the student will select a second field (Group I) or a second area of specialization (Group II) other than the major field. These three fields—the major field, the area of specialization within the major field, and the secondary field in history—constitute the history fields. In addition to these, the student will present an approved minor outside history. The written comprehensive covers the major field and (1) the area of specialization within the major field, (2) the secondary field, and (3) the minor field. On the oral examination the student will be tested on: (1) the major field, (2) the area of specialization within that major field, and (3) the secondary field in history. There will be no oral examination on the minor field unless the minor department requests it.

**Progress Review.** To evaluate the suitability of the continuation of his program, each Ph.D. student will take an oral examination after the completion of the first academic year of study. Ordinarily, the examination will be given between the completion of 12 to 18 hours of course work, but in every case the examination must be successfully completed before registration for the third semester of graduate work. The examination will be given by a committee of three faculty members selected by the department chairman.

**Required Courses.** At least one doctoral seminar.

## Courses

### 500R. Special Studies in History. (1-3:1-3:0)

Study of special topics, directed by visiting or resident faculty. Check with department secretary for current topic and instructor.



☐ Economics 574. European Economic History. (3:3:0)

☐ Economics 591. Seminar in Economic History. (2:2:0)

**609. Greek and Roman Thought.** (3:3:0) Prerequisites: Hist. 304 or 307.

A study of Greek and Roman intellectual, philosophical, and scientific achievements and their relation to Greek and Roman institutions.

**613. Medieval Problems and Thought.** (3:3:0) Prerequisites: Hist. 310 or 311. Pixton

Study of problems and interpretations in the history of the Middle Ages, from the fall of Rome to the Renaissance.

**618. Renaissance Problems and Thought.** (3:3:0) Prerequisite: Hist. 312 or consent of instructor. Jensen

Source readings, analysis, and interpretation of selected historical problems for the Renaissance.

**619. Reformation Problems and Thought.** (3:3:0) Prerequisite: History 313. Jensen

Source readings and discussions of the great men and ideas of the sixteenth century.

**621. Problems in Modern Europe.** (3:3:0) Prerequisite: Some college-level study of modern Europe. Cardon

Readings, analysis, and interpretation of selected historical problems of the nineteenth and twentieth centuries.

**625. Problems in European Diplomacy since 1815.** (3:3:0) Prerequisite: Hist. 425 or consent of instructor. Cardon

Readings on significant problems and issues in modern diplomatic history, accompanied by group analysis and interpretation.

**628. European Thought and Culture of the Enlightenment.** (3:3:0) Prerequisite: Hist. 320. Jensen

Intellectual and cultural movements of the seventeenth and eighteenth centuries, with emphasis on the rise of scientific thought and Rationalism.

**629. European Thought and Culture since 1800.** (3:3:0) Prerequisite: Hist. 429. Tobler

A study of the most influential intellectual ideas of the nineteenth and twentieth centuries—their forms of expression, and their impact on the contemporary world.

**631. Problems in Russian History.** (3:3:0) Prerequisites: Hist. 330 and 331 or consent of instructor. Holmes

Detailed examination of the Russian revolutionary movement and the development of Communism.

**635. Problems in Tudor and Stuart History.** (3:3:0) Prerequisite: Hist. 436. Thorp

Examination of major sources and historical problems of sixteenth- and seventeenth-century England.

**640R. Problems of Asian History.** (3:3:0) Prerequisite: some previous study of Asia. Hyer

Analysis and interpretation of selected problems and themes of Asian history, based on broadly selected readings.

**648R. Asian Thought and Culture.** (3:3:0) Prerequisites: Hist. 340 and 341.

Reading and analysis of important institutions and aspects of Asian development.

**650. Latin America.** (2:2:0) Prerequisites: Hist. 351 and 352. Addy

An advanced study of the generalized historical development of Latin America—colonial and national periods considered.

**659R. (Hist.-Relig.) Seminar in History of Asian Religion.** (1-6:1-2:0 ea.)

**660. Problems in Western History.** (3:3:0) Prerequisites: Hist. 462 and 463. Alexander, Allen, Warner

An analysis of the major interpretations and themes in the history of the American West.

**665. Problems in Mormon History.** (3:3:0) Prerequisites: Rel. 341 and 342, or consent of instructor.

In-depth study of Mormon historiography, sources, and historical literature, and experience in working from primary sources in Church archives and other depositories.

**666. Problems in Utah History.** (2:2:0) Prerequisite: Hist. 466. Campbell, Wood

Reading in depth in the documents and discussion of interpretations of important events in Utah history.

**670. Problems in Colonial America.** (3:3:0) Prerequisite: Hist. 370. Fox

Intensive reading and analysis of secondary literature in colonial America.

**672. Problems in the Founding of the American Republic.** (3:3:0) Prerequisite: Hist. 372.

Reading in depth and discussion of major problems in American history between 1763 and 1800.

**675. Problems in the Early American Republic (1800-1848).** (3:3:0) Prerequisite: Hist. 375. Hill

Major areas of disagreement among American historians who treat the years 1800-1848.

**677. Problems in the Civil War and Reconstruction.** (3:3:0) Prerequisite: Hist. 377. Fox

Intensive reading and analysis of secondary literature in the American Civil War.

**678. Problems in the Emergence of Modern America from the 1870s to 1920.** (3:3:0) Prerequisite: Hist. 378 or consent of instructor. Alexander

Political, economic, social, and intellectual aspects of United States development (excludes Reconstruction).

**679. Problems in Contemporary American History.** (3:3:0) Prerequisite: Hist. 379. Marlow

**681. Sources and Problems in American Intellectual History.** (3:3:0) Prerequisites: Hist. 471, 472. Hill, Marlow

Intensive reading of source materials in intellectual and social history.

**682. Problems in American Church History.** (3:3:0)

Considers controversial issues in church history: nature of Puritanism, impact of religion on American culture, influence of religion on reform, the nature of social gospel, and neoorthodoxy.

**690R. Graduate Seminar in History.** (1-3:1-3:0 ea.)

Advanced research and analysis of important historical problems and movements.

**698. Special Readings in History.** (1-2:0:Arr.)

**699. Thesis for Master's Degree.** (6-9:Arr.Arr.)

**798. Special Readings in History.** (1-2:0:Arr.)

**799. Dissertation for Doctor's Degree.** (Arr.)

## Home Economics Education

**Professor.** Brasher (chairman, 2234-B SFLC).

**Program.** Master of Science (M.S.)

**Application Consideration Dates.** Same as Graduate School deadline.

**Entry Times.** Any regular registration.

**Master of Science**

**Prerequisites.** Undergraduate emphasis in home economics education, Ed. 660 or CDFR 596R, and Stat. 552.

**Field.** Home economics education.

**Minors Permissible.** Option I—any established minor in the College of Family Living, or other colleges as approved by graduate committee, Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.).

**Required Courses.** Home Ec. Ed. 530, 532, 630, 650, and 689.

## Courses

**521R. Workshop in Home Economics Education.** (1-2: Arr.:Arr. ea.) Prerequisite: consent of instructor.

**530. Home Economics Education for Adults.** (2:2:0) Prerequisites: Home Ec. Ed. 489; consent of instructor.

The principles, practices, programs, materials, and resources for teaching home economics education to adults.

**532. Program Evaluation in Home Economics Education.** (2:2:0) Prerequisite: Ed. 479 or consent of instructor.

Analysis of evaluation techniques and construction of evaluation devices unique to home economics.

**630. Methods and Curriculum in Home Economics Education.** (3:3:0)

Intensive study of methods of teaching and curriculum development for home economics education programs.

**650. Organization and Administration of Home Economics Education Programs.** (3:3:Arr.)

**689. Theoretical Foundation of Home Economics Education.** (3:3:Arr.)

Examination of social and educational forces which affect individuals and families.

**693R. Independent Readings and Conference.** (1-3:Arr.: Arr. ea.)

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Humanities and Comparative Literature

**Professor.** R. Britsch.

**Associate Professor.** T. Britsch (chairman, 113 JKBA).

**Assistant Professors.** J. Green, D. Marshall, S. Sondrup, G. Tate.

**Program.** Master of Arts (M.A.).

**Entrance Examination Required.** None.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Arts

**Prerequisites.** Undergraduate major in the field of graduate emphasis or an undergraduate major or strong minor in each selected emphasis area.

**Requirements.** Minimum of 25 semester hours plus thesis (6-hr. min.—699).

**Fields.** Comparative literature, humanities.

### Requirements.

#### Humanities emphasis.

1. Humanities 601 and 602.

2. A primary emphasis area (12 hours or more) selected from music history, art history, literature in English, literature in a foreign language, philosophy, or history, and a secondary emphasis area (6 hours or more). One of the emphasis areas must be nonliterary.

3. A bibliography and research course.

4. Language prerequisite: six semester hours of literature in a foreign language.

### Comparative literature emphasis.

1. Humanities 610 (or 310 if not previously taken).

2. At least one course from the Humanities 371-375 series in addition to any taken on the undergraduate level.

3. From the courses in literature offered by the English and language departments: a primary emphasis on one ancient or modern literature (for example, Latin or German or English) and secondary emphasis on another. In the primary area (9 hours or more), at least two of the courses must be on the graduate level; in the secondary area (6 hours or more), at least one course must be on the graduate level. Work must be done in the original languages. Special emphasis should be placed on one era or period (for example, classicism or romanticism) and secondary emphasis on another.

4. A bibliography and research course.

5. One seminar in comparative literature.

6. A reading knowledge of two foreign languages. It is recommended that one be Greek or Latin.

## Courses

**601. The Arts in Historical Context: Greece to the High Renaissance.** (3:3:0)

A historical study of the major arts of the Western world, from Classical Greece to the High Renaissance.

**602. The Arts in Historical Context: Late Renaissance through the Modern Age.** (3:3:0)

A historical study of the major arts of the Western world, from the later Renaissance through the Modern Age.

**610. Methods of Study in Comparative Literature.** (3:3:0) Prerequisite: consent of instructor.

Approaches to the study of relationships among literatures and to analysis of types, genres, styles, etc.; definition of movements and periods.

**690R. Seminar in Comparative Literature.** (3:3:0 ea.)

Prerequisite: Hum. 610 or consent of instructor. Selected problems in comparative literature. Course content varies from semester to semester.

**695R. Individual Readings.** (1-2:Arr.:0 ea.)

For graduate majors in humanities or comparative literature only, with permission of department chairman.

**699. Thesis for Master's Degree.** (6-9:Arr.:0)

## Industrial Education

**Professors.** Hinckley, McArthur, McKell (chairman, 230 SNLB).

**Associate Professors.** Allen, Brown, Holt, Grover, Mortensen, Nish, Simmons.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

**Programs.** Master of Science (MS), Master of Industrial Education (MIE).

### Master of Industrial Education

**Prerequisites.** A valid industrial education teaching certificate and a minimum of one year's teaching experience in industrial education.



**Field.** Industrial education.

**Minors Permissible.** (9-10 semester hours) Art, instructional media, educational psychology, special education, guidance and counseling, junior college curriculum, educational supervision and administration, community school, others with departmental approval; Option II.

**Requirements.** Minimum of 33 semester hours including a field project.

**Required Courses.** Ind. Ed. 615, 625, 645, 690, 698, Ed. 560; and a minimum of 6 semester hours selected from graduate industrial and technical education courses.

**Master of Science**

**Prerequisites.** 30 semester hours in acceptable industrial and technical undergraduate courses; or a minimum of six years of bona fide trade experience.

**Fields.** Industrial arts education, technical education, technology.

**Minors Permissible.** (9-10 semester hours) Educational psychology, guidance and counseling, instructional media, special education, supervision and administration, community school, junior college curriculum, business management, others with departmental approval; Option II.

**Requirements.** Minimum of 27 semester hours plus thesis (6-hr. min.).

**Required Courses.** Ed. 600 or 660, Stat. 552 or 501, Ind. Ed. 615, 690R, 694R (2-hr. min.), 699, and a minimum of 6 semester hours selected from graduate industrial and technical education courses.

**Courses****505. Industrial Arts for Elementary Teachers.** (2:2:0)

Nature and needs of teachers instructing industrial arts in the elementary schools, with emphasis on content and procedures.

**535. Industrial Education Safety and Liability.** (2:2:0)

Principles of accident causes and prevention in industrial education laboratories. Teacher and student responsibility regarding liability; present laws affecting school safety.

**540. Industrial Occupational Information and Guidance.** (2:2:0)

Instruction in current industrial and technological advances related to industrial education.

**593R. Workshop in Industrial Education.** (1-3:Arr.:Arr. ea.)

Instruction in current industrial and technological advances related to industrial education.

**610. History and Trends in Industrial and Technical Education.** (2:2:0)

Historical developments of industrial and technical education programs for their early beginnings to the present.

**615. Principles and Objectives of Industrial and Technical Education.** (2:2:0)

General philosophy, principles, and objectives of industrial arts, vocational education, and technical education programs.

**625. Course Construction in Industrial and Technical Education.** (2:2:0)

Preparation and use of a course of study in industrial and technical fields based on an analysis of the occupation.

**630. Problems of Adult Industrial Education.** (2:2:0)

Development of the adult industrial education move-

ment and the problems relative to teaching adults, with emphasis on continuing education.

**635. Planning and Equipping Industrial and Technical Programs.** (2:2:0)

A study of industrial and technical school laboratories designed to facilitate supervised instruction in industrial arts, vocational education, and technical education.

**640. Coordination and Supervision of Industrial and Technical Education.** (2:2:0)

Methods of supervision and coordination of industrial arts, vocational education, and technical education programs, including laws, regulations, and policies affecting these programs.

**645. Visual and Graphic Materials in Industrial Education.** (2:1:2)

Basis for the selection, development, and use of visual and graphic materials and their contribution to facilitating instruction in industrial and technical education.

**690R. Seminar.** (1:1:0 ea.)

Review of latest developments and research findings in the field of industrial and technical education.

**694R. Reading and Conference.** (1-3:1-3:0 ea.)

Limited to a maximum of six credit hours.

**695R. Problems in Industrial and Technical Education.** (1-3:1-3:3-9 ea.)

Limited to a maximum of six credit hours.

**698. Field Project.** (2-4:Arr.:Arr.)**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)**Institute of Government Service**

**Distinguished Professor.** Grow.

**Professors.** Daniels, Dyer, Knighton, Moffitt.

**Associate Professors.** Buckwalter, Harlow, Slover, Snow (director, CRWH), Timmins.

**Assistant Professors.** Williams, Wright.

**Program.** Master of Public Administration (MPA).

**Entrance Examination Required.** Graduate Record Examination (general aptitude section).

**Application Consideration Date.** May 1.

**Entry Time.** Fall Semester only.

**Master of Public Administration**

**Prerequisite.** A bachelor's degree.

**Field.** Government service.

**Minor Permissible.** See Areas of Specialization.

**Requirements.** Minimum of 60 semester hours, including one area of specialization; written comprehensive examination.

**Required Courses.** Public Admin. 600, 601, 602, 603, 604, 605, 606, 607, 608, 610, 642R; Org. Behav. 610.

The basic mission of the Institute of Government Service is to prepare students for positions of leadership in the public service—state, local, and national. The program is also designed to serve those who may seek positions with public and private governmental research organizations, as well as those who may find employment with a wide variety of semiprivate organizations whose purposes are public.

**Areas of Specialization**

In addition to the required course work, each student is required to develop with the help of an advisor, an

area of specialization for the remaining required units. The following areas of specialization are supported by approved course work offered through the various departments of the university, including accounting, art and design, computer science, economics, organizational behavior, health, political science, psychology, sociology, and statistics:

Local Government Administration  
Urban and Regional Planning  
Program Management  
Personnel Administration  
Finance Administration  
Administrative Research and Planning  
Manpower Planning and Administration  
Administration of Criminal Justice  
(Law Enforcement)  
International Administration

### Law Enforcement

Graduate education in law enforcement is administered through the Institute of Government Service. Required graduate courses for the Master of Public Administration Degree with law enforcement as an area of specialization are prescribed by the coordinator of the Institute of Government Service in consultation with the coordinator of Law Enforcement.

### Courses

#### 600. The Study of Public Administration. (3:3:0)

A survey of the study and practice of public administration in modern society.

#### 601. Quantitative Analysis. (3:3:0)

Research methods in public administration; statistical analysis for decision making.

#### 602. Organizational Analysis. (3:3:0)

Classical and contemporary theories, empirical research in large-scale organizations, and the impact of bureaucracy in modern society.

#### 603. Public Personnel Administration. (3:3:0)

Processes and procedures, controls, and problems of public personnel administration.

#### 604. Public Finance Administration. (3:3:0)

Organization for public finance administration, sources of public revenue, administrative aspects of budget preparation and control, intergovernmental relationships.

#### 605. Management Information and Control Systems in Government. (3:3:0)

Basic concepts of financial information for planning and control decisions; designs of accounting systems and the use of financial reports.

#### 606. Administrative Analysis. (3:3:0)

The practical application of research to administrative and community problems, emphasis on field experience, report writing.

#### 607. Public Policy Development and Program Planning. (3:3:0)

Public policy development, decision making, and program planning.

#### 608. Contemporary Issues and the Public Administrator. (3:3:0)

An examination of contemporary public issues and their impact upon the administration of public programs.

#### 609. Practicum in Public Administration. (2-6:0:0)

#### 610. Project in Public Administration. (3:3:0)

Required of all majors; to be taken during the third semester of enrollment.

#### 620. Municipal Administration. (3:3:0)

The functions and environment of the municipal administrator.

#### 621. City Planning. (3:3:0)

Basic problems and techniques in city planning.

#### 622. State Government Administration. (3:3:0)

Problems and issues, the changing role of state government, organizational and administrative innovations to meet new and changing demands.

#### 630. International Project Administration. (3:3:0)

The administration of technical assistance, with emphasis on the cultural restraints of programs transfer.

#### 631R. Studies in Public Personnel Administration. (3:3:0 ea.)

Special studies in public personnel administration.

#### 640R. Program Administration. (3:3:0 ea.)

Basic factors underlying the effective administration of specific functional areas of public administration.

#### 641R. Studies in Financial Management for Public Administrators. (3:3:0 ea.)

Special studies in public finance administration.

#### 642R. Development Seminar in Public Administration. (3:3:0 ea.)

Required of all majors each semester in residence.

#### 643R. Directed Readings in Public Administration. (1-3:1-3:0 ea.)

Prerequisite: permission of sponsor and instructor.

## Languages

### Classical, Biblical, and Middle Eastern Languages

Professor. Clark.

Associate Professor. Phillips (chairman, 240 B-34).

Assistant Professor. Mackay.

Program. Master of Arts (M.A.).

Entrance Examination Required. Graduate Record Examination (general aptitude).

Entry Times. Fall Semester recommended.

### Master of Arts

Prerequisites. Undergraduate major in Latin or Greek or their equivalent and reading knowledge of French or German.

Fields. Greek, Latin, Latin teaching emphasis.

Minors Permissible. Any established minor in the humanities or the sciences; Option II.

Requirements. Minimum of 24 semester hours plus thesis (6-hr. min.—699).

Required Courses. None.

### Greek

561. Attic Orators. (3:3:0) Prerequisite: consent of instructor. Mackay, Phillips

612. Readings in Greek: Paul's Letters. (3:3:0) Prerequisite: one year of Greek or consent of instructor. Mackay, Phillips.

613. Readings in Greek: General Epistles and the Apocalypse. (3:3:0) Prerequisite: one year of Greek or consent of instructor. Mackay, Phillips

665. The Greek Historians. (3:3:0) Prerequisite: consent of instructor. Mackay, Phillips

671. Homer. (3:3:0) Prerequisite: consent of instructor. Mackay, Phillips



- 679. The Greek Dramatists.** (3:3:0) Prerequisite: consent of instructor. Mackay, Phillips
- 694R. Seminar in Literature.** (3:3:0) Prerequisite: consent of instructor. Mackay, Phillips
- 699. (Greek-Latin) Thesis for Master's Degree in Classics.** (6-9:Arr.:0) Mackay, Phillips

## Latin

- 561. Medieval Latin.** (3:3:0) Prerequisite: Lat. 301 or 112 or equivalent. Mackay
- 621. Romance Philology.** (3:3:0) Clark
- 661. Cicero.** (3:3:0) Clark, Mackay
- 665. The Latin Historians.** (3:3:0) Clark, Phillips
- 671. Virgil.** (3:3:0) Clark, Phillips
- 675. The Latin Poets.** (3:3:0) Clark, Phillips  
Horace, Ovid, Lucretius, etc.
- 679. The Latin Dramatists.** (3:3:0) Clark, Phillips  
Plautus, Terence, etc.
- 681, 682. The Latin Fathers.** (3:3:0 ea.) Prerequisite: consent of instructor. Mackay, Phillips
- 690R. Directed Readings.** (1-2:Arr.:0 ea.) Clark, Mackay, Phillips  
Individual study on a graduate level.
- 692R. Seminar in Philology.** (2:2:0 ea.) Clark, Mackay, Phillips
- 694R. Seminar in Literature.** (2:2:0 ea.) Clark, Phillips
- 699. (Greek-Latin) Thesis for Master's Degree in Classics.** (6-9:Arr.:0)

## Hebrew

- 681. Studies in the Hebrew Old Testament.** (3:3:0) Prerequisite: two years of Hebrew or consent of instructor.
- 682. Studies in Hebrew.** (3:3:0) Prerequisite: Hebrew 681.

## French and Italian

**Professors.** Brown, Green, Lee (emeritus).  
**Associate Professors.** H. Clark, Kimball, Lambert, Turner (chairman, 357 MCKB).  
**Assistant Professors.** Ashford, Jensen.

**Programs.** Master of Arts (M.A.), Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** None.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** A bachelor's degree in French or equivalent, plus a reading knowledge of another foreign language.

**Fields.** French language, French literature, French teaching emphasis.

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 28 semester hours plus thesis (6-yr. min.—699).

**Required Courses.** French 601 and 677R.

## Doctor of Philosophy

**Prerequisites.** A bachelor's degree or a master's degree in French.

**Fields.** French language, French literature, French teaching emphasis.

**Minors Permissible.** Option I or Option II.

**Requirements.** A minimum of 62 semester hours plus a dissertation (18-hr. min.—799). Languages required: a reading knowledge of German, Latin, and one other Romance language.

**Required Courses.** French 601, 677R.

## French

**511. Advanced Conversation for Students of Institute.** (0:2:1)

**520. Teaching French Grammar for Students of Institute.** (2:2:0)

**601. Bibliography and Research Techniques.** (1:1:0)

☐ **Latin 621. Romance Philology.** (3:3:0) R. Clark

**622. History of French Language.** (2:2:0) R. Clark

**626. French Phonology.** (2:2:2) Prerequisite: French 326 or consent of instructor. Recommended for teachers.

**629. Stylistics.** (2:2:0)  
Intensive linguistic and literary analysis of French, especially from modern writers: syntax, translation, advanced stylistic analysis and advanced explication of texts.

**645R. Studies in French Civilization.** (3:3:0 ea.) Prerequisite: French 445 or consent of instructor.

**660R. Studies in Medieval French Literature.** (3:3:0) Ashford

Course content varies from semester to semester. The specific topic for a given term is listed in the class schedule.

**665R. Studies in Renaissance French Literature.** (3:3:0 ea.) Ashford

Course content varies from semester to semester. The specific topic for a given term is listed in the class schedule.

**670R. Studies in Seventeenth-Century French Literature.** (3:3:0 ea.) Brown, Green

Course content varies from semester to semester. The specific topic for a given term is listed in the class schedule.

**675R. Studies in Eighteenth-Century French Literature.** (3:3:0 ea.) Lambert

Course content varies from semester to semester. The specific topic for a given term is listed in the class schedule.

**677R. Principles of Foreign Language Learning and Teaching.** (2:2:0 ea.) Prerequisite: French 377 or consent of instructor. Jensen

**680R. Studies in Nineteenth-Century Romantic and Post-Romantic Movements.** (3:3:0 ea.)

H. Clark, Green, Kimball

Course content varies from semester to semester. The specific topic for a given term is listed in the class schedule.

**685R. Studies in Twentieth-Century Pre- and Post-World War II Movements.** (3:3:0 ea.) Turner

Course content varies from semester to semester. The

specific topic for a given term is listed in the class schedule.

**690R. Directed Readings.** (1-3:Arr.:0 ea.)

Individual study on a graduate level, to fit the needs of the graduate student. Not to be taken in lieu of classes.

**692R. Seminar in Philology.** (1-2:1-2:0 ea.) R. Clark

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**795R. Seminar in French Literature.** (3:3:0 ea.)

Course content varies from semester to semester. The specific topic for a given term is listed in the class schedule.

**799. Dissertation for the Ph.D. Degree.** (1-6:Arr.:0)

## Germanic Languages

**Professors.** Davis (chairman, 326 MCKB), Folsom, Rogers, Speidel, Watkins, Smith.

**Associate Professors.** Baker, Georgi, Roos.

**Assistant Professor.** Keele.

**Programs.** Master of Arts (M.A.), Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** None.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Fall Semester recommended.

## Master of Arts

**Prerequisites.** Undergraduate major in German or its equivalent and knowledge of a second European language of 201 equivalent level.

**Fields.** German language, German literature, German teaching emphasis.

**Minors Permissible.** Option I or II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699); written comprehensive examinations.

**Required Courses.** German 601, 620, 689; one seminar in specialty area.

## Doctor of Philosophy

**Prerequisites.** Reading knowledge in two foreign languages (usually French, Russian, Latin).

**Fields.** German language, German literature, German teaching emphasis.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 62 semester hours plus a dissertation (18-hr. min.—799).

**Required Courses.** German 601, 620, 689; two seminars in specialty area.

## German

**511. Advanced Conversation.** (2:2:1) For language teachers only.

**520. Advanced German Composition and Grammar.** (2:2:0) Prerequisite: German 321 or consent of instructor. Exercises in vocabulary, grammar, and composition for high school and junior college teachers.

**601. Bibliography and Research Techniques.** (1:1:0) Davis, Smith

**615. Teaching German Grammar.** (3:3:0) Prerequisites: Ling. 325, German 429, or consent of instructor. Folsom, Watkins

**620. History of the German Language.** (3:3:0) Folsom, Watkins

**622. Gothic and Comparative Germanic Linguistics.** (3:3:0) Folsom, Watkins

**626. German Phonology.** (3:3:0) Prerequisite: German 326 or consent of instructor. Folsom

A study of the sounds of German and its stress, rhythm, and intonation patterns, contrasted and compared with those of English.

**628. Middle High German.** (3:3:0) Folsom, Watkins

**641. German Poetry.** (3:3:0) Prerequisites: German 601 and 650 or consent of instructor.

**642. German Drama.** (3:3:0) Prerequisites: German 601 and 650 or consent of instructor.

**643. The German Novel to 1945.** (3:3:0) Prerequisites: German 601 and 650 or consent of instructor.

**644. The German Novelle.** (3:3:0) Prerequisites: German 601 and 650 or consent of instructor.

**645. Advanced Studies in the Culture of German Speaking Countries.** (3:3:0) Kelling, Watkins

**650. Literary Criticism.** (3:3:0) Baker, Keele, Speidel

**677. Principles of Foreign Language Learning and Teaching.** (2:2:0) For experienced teachers only.

Luckau, Jarvis, Taylor, Jensen  
Appraisal of popular approaches in foreign language teaching; analysis of issues, trends, and innovations; and choice of area of interest for thesis project.

**689. Contemporary German Literature.** (3:3:0) Prerequisite: consent of instructor. Keele, Smith

**690R. Special Studies in German.** (1-2:Arr.:Arr. ea.) By special permission only.

**692R. Seminar in Philology.** (3:3:0 ea.) Topics to be announced.

**694R. Seminar in Literature.** (3:3:0 ea.) Topics to be announced.

**697R. Seminar in the Teaching of German.** (2:2:0 ea.) Jarvis  
Latest developments and research in various aspects of language teaching.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

**799. Dissertation for the Ph.D. Degree.** (Arr.)

## Spanish and Portuguese

**Professors.** Anderson, Compton, de Jong (emeritus), Dowdle, Gibson (chairman, 303 MCKB), Moon.

**Associate Professors.** Lyon, Quackenbush, Rosen, Shreeve, Taylor.

**Assistant Professors.** Ashworth, Clegg, Dennis, Jackson.

## Programs

Spanish: Master of Arts (M.A.), Doctor of Philosophy (Ph.D.).

Portuguese: Master of Arts (M.A.).

**Entrance Examinations Required.** None for M.A. students. Screening exam for doctoral degree students.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.



## Master of Arts

**Prerequisites.** Undergraduate major in Spanish or Portuguese, or its equivalent.

**Fields.** Spanish: language, literature, teaching emphasis.  
Portuguese: language, literature.

**Minor Permissible.** Option I or II.

**Requirements.** Minimum of 28 semester hours plus thesis (6-hr. min.—699). The reading knowledge of a second foreign language is also required. For the teaching emphasis this must be an approved language, and reading proficiency must be on a third semester (201) level. Mastery of Spanish as demonstrated by a proficiency test. A minimum of one year of language teaching experience (or 2 years as a student instructor).

## Doctor of Philosophy

**Prerequisites.** Undergraduate major in Spanish or Portuguese, or its equivalent.

**Fields.** Spanish language, Spanish literature, Spanish teaching emphasis.

**Minors Permissible.** Any approved minor.

**Requirements.** A minimum of 62 semester hours beyond the B.A. degree plus dissertation (18-hr. min.—799). Language or Literature emphasis: a reading knowledge of German, Latin, and one other Romance language. Teaching emphasis: mastery of Spanish as demonstrated by a proficiency test, mastery of two additional languages (as approved by advisory committee) at a third-semester (201) level, and a minimum of three years of language teaching, including some secondary school experience.

**Required Courses.** As determined in consultation with the graduate advisory committee.

## Portuguese

521. Romance Philology. (3:3:0) Clark, Clegg

522. History of the Portuguese Language. (2:2:0)  
Gibson, Jensen

552. Machado de Assis. (2:2:0) Prerequisites: Portuguese 441, 451, or equivalent. Dennis

553. O Modernismo. (2:2:0) Prerequisites: Portuguese 441, 451, or equivalent. Dennis, Jensen  
The modern movement in Brazilian literature (1920-1945).

620R. Portuguese Composition. (3:3:0 ea.) Dennis

642. Contemporary Portuguese Literature. (3:3:0)  
Dennis

650. Brazilian Literature. (3:3:0) Dennis

651. Contemporary Brazilian Literature. (3:3:0) Dennis

690R. Directed Readings (1-2:0:Arr. ea.)

692. Seminar in Philology. (2:2:0)

694R. Seminar in Literature. (2:2:0 ea.)

699. Thesis for Master's Degree. (6-9:Arr.:Arr.)

## Spanish

520. Advanced Spanish Composition and Grammar. (2:2:0)

521. Romance Philology. (3:3:0) Clark, Clegg

522. History of the Spanish Language. (2:2:0)  
Clegg, Dowdle, Gibson

523. Border Spanish. (3:3:0) Prerequisite: Spanish 321 or consent of instructor. Clegg

An introduction to Mexican-American speech patterns and their impact upon the Spanish-speaking American subculture.

553. Spanish-Speaking American (Chicano) Literature. (3:3:0) Prerequisite: Spanish 321 or consent of instructor. Lyon

A survey course of Spanish-English literature of the Mexican-American and other Spanish minorities within the United States.

556. Hispanic-American Poetry. (2:2:0)  
Compton, Lyon, Quackenbush

580R. Nineteenth-Century Spanish Literature. (3:3:0 ea.)  
Prerequisite: Spanish 441 or consent of instructor.  
Ashworth, Dowdle, Gibson

584. Generation of '98. (3:3:0) Ashworth, Moon

601. Bibliography and Research Techniques. (2:2:0)  
Rosen, Taylor

615. Teaching Spanish Grammar. (2:2:0) Prerequisites: Ling. 325 and Spanish 326 or consent of instructor. Anderson, Clegg

An analysis and organization of Spanish phonology, morphology, and syntax for effective teaching of Spanish grammar.

626. Spanish Phonology. (2:2:0) Prerequisite: Spanish 326 or consent of instructor. Anderson, Clegg

A study of the sounds of Spanish and its stress, rhythm, and intonation patterns contrasted and compared with those of English.

645. Advanced Studies in Hispanic Culture. (2:2:0)

653. Latin-American Drama. (2:2:0) Quackenbush

654R. The Spanish-American Novel. (2:2:0 ea.)  
Compton, Lyon, Quackenbush

656. Modernista Prose and Poetry. (2:2:0)  
Compton, Lyon, Quackenbush

657. Hispanic-American Essay. (2:2:0) Lyon

658. Hispanic-American Short Story. (2:2:0)  
Compton, Lyon, Quackenbush

660. Spanish Medieval Literature. (2:2:0) Dowdle, Gibson

670R. Golden-Age Literature. (3:3:0 ea.) Dowdle, Rosen

677. Principles of Foreign Language Learning and Teaching. (2:2:0) Jackson, Taylor

Study of basic theories and principles of language learning and teaching. Issues, trends, and current practices are examined. For experienced language teachers.

658R. Twentieth-Century Literature. (2:2:0 ea.)  
Ashworth, Moon

690R. Directed Readings. (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.

Individual study on a graduate level, to fit the needs of the graduate student.

692R. Seminar in Philology. (2:2:0 ea.)

694R. Seminar in Spanish Literature. (2:2:0 ea.)

697R. Seminar in Spanish Teaching. (2:2:0 ea.)  
Anderson, Jackson, Rosen, Taylor  
For experienced language teachers.

699. Thesis for Master's Degree. (6:Arr.:Arr.)

794R. Seminar in Literature. (2:2:0 ea.)

799. Dissertation for the Ph.D. Degree. (Arr.)

## Latin American Studies

**Professors.** Addy (history), Blair (linguistics), Compton (Spanish), Corbridge (agricultural economics), Gibson (Spanish and Portuguese), Layton (geography), Warner (history).

**Associate Professors.** Craig (sociology), DeHoyos (sociology), Dutton (economics), Fairbanks (communications), Lyon (Spanish), Madsen (TESL), Shreve (coordinator, 172 FOB), Spencer (sociology), Tullis (political science).

**Assistant Professors.** Chandler (history), Clegg (Spanish), Dennis (Portuguese), Fletcher (law enforcement), Quackenbush (Spanish), Santiago (continuing education), Skinner (youth leadership).

**Instructors.** Hawkins (anthropology and archaeology), Larson (food science and nutrition).

**Program.** Master of Arts (M.A.).

**Entrance Examination Required.** None.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Arts

**Prerequisites.** Undergraduate preparation in the areas of Latin American studies. Oral and written proficiency in the Spanish or Portuguese language,\* to be determined by individual examination or successful completion of Spanish or Portuguese 321.

**Field.** Latin American studies.

**Minors Permissible.** Any approved minor.

**Requirements.** For the Master of Arts Degree, the student will complete at least the following 34 hours of graduate work:

1. 15 semester hours (including at least one research seminar) in his preferred department of concentration.
2. 5 semester hours in a related department.
3. 5 semester hours in a second related department.
4. 3 semester hours in a Latin American Studies Seminar (690R).
5. 6 semester hours of thesis reflecting the student's multi-disciplinary interests and acceptable to both his department of concentration and Latin American Studies.

A final oral examination is required. Of the 34 semester hours, 21 (including project, internship, or thesis) must be in Latin American content courses. Those courses are to be approved by the coordinator. Recommended areas for major and minor fields are: business, agricultural economics, food science and nutrition, law enforcement, public relations, geography, education (elementary, secondary, international), youth leadership, health, economics, international relations, linguistics, Teaching English as a Second Language, nursing, Spanish, sociology, political science, public administration, organizational behavior, etc.

### Graduate Minor

**Prerequisites.** None.

**Field.** Latin American Studies.

**Requirements.** The same proficiency in Spanish or Portuguese as for the major; 11 hours in graduate-level courses in Latin American related subjects.

**\*Language Option.** When a student already has fluency in one of the required languages, he is encouraged to seek proficiency in the other or in a native language (Cakchiquel, Quechua, Guarani, etc.) of Latin America.

**Study Abroad.** The University currently offers excellent opportunities for study in Spain and Latin America.

These programs are especially advantageous to the student of Latin American Studies and provide an opportunity for on-the-scene study in the Spanish language, history, geography, political science, sociology, and various other related fields. The courses offered in these programs help fulfill the requirements for the M.A. degree in Latin American Studies. All students are strongly encouraged to participate in one or more of these programs, especially those who have had no previous overseas experience.

### Courses

#### Business Management

430 (3) Introduction to International Business (Latin American emphasis)

431 (3) International Marketing (Latin American emphasis)

#### Communications

580 (3) Comparative World Communication Systems (Latin America)

#### Geography

455 (3) Geography of Latin America

502R (2) Seminar in Regional Geography (semesters with Latin American content)

580 (2) Geography of Underdeveloped Areas

#### History

351 (3) History of Latin America

453 (3) Mexico

454 (3) Argentina, Brazil, Chile

455 (3) Northern South America

457 (3) The Indian in Latin American History

460 (2) The Spanish Borderlands

650 (2) Latin America

#### Languages

##### (Portuguese)

552 (2) Machado de Assi

553 (2) O Modernismo

620R (3) Portuguese Composition

651 (3) Contemporary Brazilian Literature

##### (Spanish)

455 (2) Ibero-American Culture

520 (2) Advanced Spanish Composition and Grammar

556 (2) Hispanic-American Poetry

645 (2) Advanced Studies in Hispanic Cultures

654R (2) The Spanish-American Novel

656 (2) Modernista Prose and Poetry

658 (2) Hispanic-American Short Story

#### Latin American Studies

690R (1-3) Interdisciplinary Seminar on Contemporary Latin American Problems

#### Political Science

501R (3) Advanced Topics (course designed to meet the needs of Latin American students)

#### Sociology

590R (1-3) Special Topics in Sociology (courses designed to meet the needs of Latin American students)

### Courses

690R. Interdisciplinary Seminar on Contemporary Latin American Problems. (3:3:0) Prerequisite: consent of instructor.

699. Thesis for Master's Degree. (1-6:Arr.:Arr.).

## Library and Information Sciences

**Associate Professors.** Johnson (director, 548 HBLL), Marchant, Wright.

**Assistant Professors.** Lamson, Purdy, Smith, Stirling.

**Program.** Master of Library Science (MLS).



**Entrance Examination Required.** Marginal applicants may be required to take the Graduate Record Examination.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration except at Spring Term.

## Master of Library Science

**Required Courses.** LIS 501, 513, 523, 528, 534, 536, 538, 596R, 697. Additional courses to total a minimum of 38 hours will be chosen in consultation with an adviser. LIS 501 should be taken the first semester.

**Field.** Library Science.

**Requirements.** 38 semester hours (a minimum of one calendar year). Some prerequisites may be required. A comprehensive examination and a research project and project defense are required during the last semester.

**Additional Requirements.** There is a large range of skills useful to librarians, including such skills as foreign languages, instructional media, communications, computer programming, systems analysis, statistics, and English usage. Depending upon the student's objectives, up to 12 hours of skill courses may be required. No more than 6 hours of skill credit may be applied toward the degree.

In addition to course work, attendance at a number of informal lectures without credit is required of all students each semester. These colloquia are intended to broaden the student's outlook on librarianship and related fields through presentations by outstanding guest lecturers.

Undergraduate students may register for LIS 513, 523, 528, 557. All other classes are restricted to LIS graduate majors and minors, with the following exception: computer science undergraduate and graduate majors, educational media graduate majors, and communications graduate majors may register for LIS 538, 596, and 656.

S.R. and Anita Shapiro (New York bookman) have established a gift of a \$100 U.S. Savings Bond to the outstanding graduate each year. This may be awarded as two \$50 bonds to two outstanding students.

## Courses

### 501. Foundations of Library and Information Sciences. (4:4:0)

The basic principles and concepts underlying the cultural, intellectual, and historical foundations of library and information sciences.

### 513. Selection and Acquisition of Materials. (3:3:0)

Principles, criteria, and practice in evaluation, selection, and acquisition of book and nonbook materials. Required.

### 523. Reference Theory and Service. (3:3:0)

Intensive study of basic reference materials and services, including general bibliographic tools and form. Required.

### 528. Organization and Processing of Materials. (4:4:0)

Theory and principle of the documentation of book and nonbook materials as expressed through classification and cataloging.

### 534. Research in Library and Information Sciences. (2:2:0)

Bases, methods, and techniques of research. Experience in manipulating data. Statistical computer programs will be used and a research paper completed under individual advisement.

### 536. Library Organization and Administration. (3:3:0)

Prerequisite: LIS 501.  
Organization and administration of libraries. Organizational and administrative theory discussed. Problems

associated with personnel, authority, policy, planning, reports, standards, etc.

### 538. Documentation and Information Retrieval. (3:3:0)

Survey of nonconventional and experimental methods and devices for cataloging, indexing, and retrieving; data processing and the library.

### 539. Practicum in Librarianship. (1:1:0)

Prerequisites: completion of or concurrent registration in LIS 501, 513, 523, and 528.  
Thirty hours of practice work under the supervision of a professional librarian. Required.

### 543. Literature of the Social Sciences. (2:2:0)

Analysis of subject concerns, methodology, and unique information needs of the various social science fields. Examination of literature resources and problems of bibliographic control.

### 545. Literature of the Humanities. (2:2:0)

Analysis of subject concerns, methodology, and unique information needs of the various humanities fields. Examination of literature resources and problems of bibliographic control.

### 547. Literature of the Sciences. (2:2:0)

Analysis of subject concerns, methodology, and unique information needs of the various fields of science. Examination of literature resources and problems of bibliographic control.

### 557. The Instructional Media Center in the School. (2:2:0)

Prerequisite: LIS 536.  
The place of the IMC in educational programs. Standards, management, equipment, budget, and services.

### 567. Library Services for the Young Adult. (2:2:0)

Critical study of reading interests and library needs of young adults.

### 580R. Workshop: Current and Special Problems. (1-2:1-2 weeks: 40-50 hrs. per week ea.)

### 590. Current Problems in Technical Services. (3:3:0)

Consideration of major problems in acquisitions, cataloging, classification, and conservation of materials.

### 596. Advanced Information Science. (3:3:0)

Formal methods of intellectual access to documents. Automatic content analysis. Classificatory, query strategy, relevance, and similar concepts and techniques.

### 614. Literature of Mormonism. (2:2:0)

An intensive survey of the literature of Mormonism with emphasis upon the selection, organization, and utilization of this literature in libraries.

### 624. Government Publications. (2:2:0)

Intensive study of documents published by federal, state, and local governments and the U.N., with attention to their selection, organization, and use in different types of libraries.

### 628. History and Theory of Manuscription. (2:2:0)

Development of written communications and librarianship in the ancient world.

### 632. History and Theory of Printing. (2:2:0)

Development of printed communications and librarianship in the modern world.

### 633. Advanced Library Administration. (3:3:0)

Application of such modern concepts as systems theory and participative management to library organizational behavior.

### 642. Seminar: Advanced Reference and Bibliography. (3:3:0)

Types of bibliography, advanced bibliographic techniques, administering reference services, analysis of research problems. The librarian-user interface.

**645. Seminar: Classification Theory.** (2:2:0)

Philosophical and theoretical bases of classification and cataloging.

**656. Information Systems Analysis and Library Automation.** (3:3:0)

Operations research techniques and data processing in all areas of librarianship.

**662. Trends in Library Services for Children.** (3:3:0)

Prerequisite: Ed. 340.

Historical development of children's libraries, materials, and services. Publishers, illustrators, and authors are considered. Relationship to sociological, educational, and philosophical forces of various periods discussed.

**664. Seminar: Philosophical Bases of Library and Information Sciences.** (2:2:0)

The social, ethical, logical, and epistemological bases of library and information sciences.

**668. Seminar: Psycho-Sociological Base of Library and Information Sciences.** (2:2:0)

Patterns of behavior in the librarian-user interface involving communication and information transfer.

**694R. Independent Research.** (1-2:Arr.:0 ea.)**696R. Research Seminar.** (2:2:0 ea.)**697. Project Seminar.** (2:2:0)

The following courses may be used as electives; some may be required to complete areas of specialization.

☐ Computer Science 351. Information Structure. (3:3:1)

☐ Computer Science 451. Information Systems Analysis. (3:3:2)

☐ Education 340. Children's Literature. (2:2:0)

☐ Education 406. Educational Media Production and Utilization. (2:1:3)

☐ Education 506. Educational Media in the School. (3:2:3)

☐ Education 509. Selection and Utilization of Audio-visual Materials. (2:2:0)

☐ Education 610. Designing and Producing Instructional Materials. (2:2:1)

☐ Education 611. Coordination of Educational Media. (2:2:0)

☐ Education 628. Children's Literature. (2:2:0)

☐ English 420. Literature for Adolescents. (2:2:0)

☐ Psychology 570. Computer Use in Behavioral Sciences. (3:3:6)

☐ Speech and Dramatic Arts 527. Storytelling. (2:2:0)

☐ Statistics 501. Statistics for Research Workers I. (5:4:3)

☐ Statistics 502. Statistics for Research Workers II. (5:4:3)

## Linguistics

Professors. Blair, Cox (chairman, 157 FB).

Associate Professors. Lytle, Madsen.

Assistant Professor. Baird.

**Programs.** Master of Arts (M.A.), Graduate Certificate in Teaching English as a Second Language.

**Entry Times.** Any regular registration.

### Master of Arts in Linguistics

**Prerequisites.** (1) 5 credits in upper-division linguistics; (2) intermediate-level competence in two foreign lan-

guages (201 or equivalent) or high-level competence in one foreign language (321 or equivalent).

**Fields.** Applied linguistics, theoretical linguistics, TESL.

**Minors Permissible.** Any established minor in the humanities or the sciences; Option II.

**Requirements.** Minimum of 25 semester hours plus thesis (6-hr. min.—699).

**Required Courses.** Ling. 528, 693R.

### Courses

**501R. General Linguistics.** (3:3:0 ea.) Baird, Blair  
Topics in general linguistics; models and methodologies.

**525. Descriptive Phonology.** (3:3:0) Baird, Lytle  
The structural description of the sound systems of language.

**526. Generative Phonology.** (3:3:0) Prerequisite: consent of instructor. Lytle  
Techniques for analyzing phonological data and preparing phonological statements through ordered rules.

**527. Descriptive Morphology.** (3:3:0) Baird, Blair  
The structural description of linguistic forms.

**528. Syntax.** (3:3:0) Prerequisite: Ling. 527. Baird, Lytle  
Fundamental approach to generative grammar. Techniques of analysis of linguistic data and preparation of grammatical statements through ordered rules.

**529R. Linguistic Structures.** (3:3:1 ea.) Lytle  
A consideration and comparison of the phonological and morphological structures of several non-Indo-European languages. Students work with native informants.

**531. Sociolinguistics.** (3:3:0) Prerequisite: consent of instructor. Blair, Cox  
A survey of research and theory in anthropological linguistics and sociolinguistics.

**590R. Readings in Linguistics.** (1-3:Arr.:0 ea.)  
Individual study of current linguistic literature. Occasional discussion sessions with instructor and other class members.

**623R. Problems in Contrastive Linguistics.** (3:3:0 ea.) Blair, Lytle  
Contrast of structures in English and selected languages and the development of grammatical description from these contrasts.

**626. Problems in Historical Linguistics.** (3:3:0) Baird, Blair  
Offered 1976 and alternate years.

**693R. Seminar in Linguistics.** (2:2:1 ea.) Baird, Blair  
Advanced research and analysis of various linguistic problems.

**699. Thesis for Master's Degree.** (1-6:Arr.:0)

### Master of Arts Degree and Graduate Certificate in Teaching English as a Second Language (TESL)

M.A. candidates may choose from among four areas of emphasis: teaching, materials development, supervision-administration, or composite.

**Graduate Certificate.** The Certificate program (like the M.A. program with teaching emphasis) is designed to prepare teachers for both overseas and U.S. assignments. Type A Certificates include teacher certification; Type B Certificates do not.

**Prerequisites.** B.A. or B.S. degree and admission to Graduate School.



**Application Consideration Dates.** Same as Graduate School deadlines.

**Requirements.** 35 semester hours (including thesis where applicable) for M.A. 28 semester hours (including field study) for Certificate.

#### Required Courses (M.A.)

**Core Courses.** Engl. 529 or Ling. 528; TESL 527 (or Ling. 525), and TESL 528, 577, 578, 698 (TESL 201 required for most non-native speakers).

**Teaching emphasis.** Core courses; TESL 579, 581, 583, culture course, and electives.

**Materials development emphasis.** Core courses, minor, thesis, and electives.

**Supervision-administration emphasis.** Core courses; minor, TESL 584, 697; and electives.

#### Required Courses (Graduate Certificate)

TESL 527 (or Ling. 525), 528, 577, 578, 579, 583, 696; Ling. 325 (or Engl. 321 or 325), Ling. 528 (or Engl. 529); culture course.

#### Courses

**527. Phonology of Modern English.** (3:3:3) Prerequisites: English 321 or 325 or Ling. 325 or equivalent.

Cox, Luthy  
Articulatory phonetics (phonemics), intonation, and contrastive analysis of English sounds with those of other languages.

**528. Phonology of Modern English—TESL Laboratory.** (2:0:3)

Cox, Luthy  
Practical experience in developing aural discrimination and accent correction skills. Extensive work with bilinguals.

**577. Procedures in Teaching English as a Second Language.** (3:3:3) Prerequisites: Engl. 321 or 529 or Ling. 423.

King, Madsen  
Methods and materials used in teaching English as a second language; observation, discussion, and some teaching.

**578. TESL Materials Selection and Development.** (3:3:0)

King, Madsen  
For TESL students. Evaluation and adaptation of texts, creation of tests, tapes, exercises, games, supplementary aids and texts.

**579. TESL Student Teaching.** (4-8:0:4-8) Prerequisites: TESL 577 and consent of instructor.

King, Madsen  
Teaching practice in a TESL setting. On-the-job training in planning instruction, preparing materials, and conducting actual classes.

**581. TESL Testing.** (2:2:0) Cox, Madsen  
Instruction in preparing and evaluating language tests and in carrying out fundamental statistical processes.

**583. TESL Literature.** (3:3:0) Prerequisite: Engl. 251 or equivalent.

Cox, King, Madsen  
Methods of teaching literature to non-native English speakers, both TEFL and TESL.

**584. TESL Supervision-Administration.** (2:2:0) Prerequisite: Engl. 577.

Cox, Madsen  
Presentation of ministerial language policies, teacher selection and preparation, program development and direction.

**585R. Problems in Teaching English as a Second Language.** (3:3:0 ea.) Cox, King, Madsen

Instruction enabling prospective teachers to cope with TESL problems of linguistic and social convention.

**696. TESL Field Study.** (1-2:1-2:0) Prerequisite: completion of or concurrent registration in TESL 577 and 578, or consent of instructor.

King, Madsen

Individual research projects for TESL Graduate Certificate candidates, culminating in a practical paper.

**697. TESL Supervision-Administration Internship.** (4:0: approximately 25 per week for one-half semester) Prerequisites: TESL 584 and the majority of coursework in TESL.

Cox, King, Madsen  
Actual field work in TESL settings, involving supervision, in-service training, curricula-program study and administration.

**698. TESL Seminar.** (2:2:0) Prerequisites: Completion of majority of TESL courses; consent of instructor.

Cox, King, Madsen  
An integrative seminar concerned with TESL theory and practice, research, and comparative methodology.

## Mathematics

**Professors.** Burton, Crawley, Fearnley, Gee, Gill, Hiram (chairman, 290 TMCB), Jamison, Larsen, Moore, Peterson, Robinson, Snow, Yearout.

**Associate Professors.** Campbell, Garner, Hansen, Higgins, Skarda, Wickes, Wight.

**Assistant Professors.** Armstrong, Chatterley, Ferguson, Lamoreaux, Tolman, Walter, Wynn.

**Programs.** Master of Science (M.S.), Master of Arts (M.A.).

**Entrance Examinations Required.** For foreign applicants, the Graduate Record Examination.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

### Master of Science

**Prerequisites.** Credit at least equivalent to the Brigham Young University requirements for a B.S. degree in mathematics. Also, a year's sequence in abstract algebra and one in advanced calculus.

#### OPTION I

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 18 semester hours of graduate mathematics, a minor (9 hrs.), plus thesis (6-hr. min.).

**Required Courses.** Any nine hours chosen from Math. 551, 631, 641, 671.

#### OPTION II

**Requirements.** Minimum of 24 semester hours of graduate mathematics courses plus thesis (6-hr. min.).

**Required Courses.** Three of the four sets: Math. 551, 552; Math. 631, 641; Math. 634, 647; or Math. 671, 672.

This program is designed to prepare students for (1) additional study and research in mathematics at the Ph.D. level, (2) employment in industry or government.

### Master of Arts

**Prerequisites.** Credit at least equivalent to the current Brigham Young University requirements for a B.A. degree in education with a teaching major in mathematics, a B.A. degree in mathematics, or a B.S. degree in mathematics.

**Minors Permissible.** Option I.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699), also state teacher certification. (Required certification courses may not be part of the graduate program.)

**Required Courses.** Math. 541, 542, 629. Any two-semester 600 sequence or Math. 551, 552.

This program is designed to prepare students for teaching mathematics in junior colleges or secondary schools.

## Master of Arts in Mathematics Education

**Prerequisites.** In-service status as a secondary teacher of mathematics.

**Minor Required.** Education—12 hours.

**Required.** Education

- 536 (3) Secondary Curriculum Methods
- 636 (3) Secondary Curriculum and Methods: Design

**Electives.** Education

- 506 (3) Educational Media in the School
- 560 (3) Educational Tests and Measurements
- 601 (3) Comparative Current Educational Philosophy
- 606 (4) History of Education in Europe and America
- 608 (3) Social Foundations of Education
- 656 (3) Advanced Educational Psychology
- 696R (1-4) Independent Research
- 727 (2) Curriculum of the Public Schools

**Requirements.** Minimum of 36 semester hours (12 hours Education, 24 hours Mathematics). Math. 629 and any seven courses selected from the following: Math. 300, 332, 371, 385, 387, 451, or any 500- or 600-level courses (where no more than 10 hours of course work is selected from below the 500 level). No thesis required.

## Courses

**300. History of Mathematics.** (3:3:0) Prerequisite: Math. 112 or 301.

**332. Introduction to Complex Analysis.** (3:3:0) Prerequisite: Math. 214 or 244.

**371, 372. Abstract Algebra.** (3:3:0 ea.) Prerequisites: Math. 142, 214, or 111 and 301.

**385. Linear Algebra.** (3:3:0) Prerequisite: Math. 111 or 301.

**387. Theory of Numbers.** (3:3:0) Prerequisite: Math. 111 or 301.

**411. Numerical Methods.** (3:3:0) Prerequisites: Comput. Sci. 130; Math. 214 or 244. Recommended: Math. 322 or 372 or 385.

**434. Introduction to Ordinary Differential Equations.** (3:3:0) Prerequisite: Math. 214 or 244.

**436. Introduction to Partial Differential Equations.** (3:3:0) Prerequisite: Math. 321 or 434.

**451. Modern Geometry 1.** (3:3:0) Prerequisite: Math. 301 or 371.

**452. Modern Geometry 2.** (3:3:0) Prerequisite: Math. 451.

**501. Real Numbers.** (3:3:0) Prerequisite: Math. 371. Recommended: Math. 541.

Extensive examination of various axiomatic descriptions of the real numbers and the interrelationships among these descriptions. Offered on demand.

**502. Set Theory.** (3:3:0) Prerequisite: Math. 371.

Zermelo-Fraenkel axioms for set theory; the axiom of choice; ordinal and cardinal numbers; algebra of sets. Offered on demand.

**508. Mathematical Logic.** (3:3:0) Prerequisite: Math. 371 or 541.

Propositional and first-order predicate calculi; set theories; well-ordering; transfinite induction.

**512. Introduction to Numerical Analysis.** (3:3:0) Prerequisite: Math. 411.

Theory of constructive methods in mathematical analysis.

**513R. Advanced Topics in Applied Mathematics.** (3:3:0 ea.) Prerequisite: consent of instructor. Offered on demand.

**541, 542. Introduction to Real Analysis.** (3:3:0 ea.) Prerequisite: Math. 244 or 315.

A rigorous treatment of continuity, differentiability, integration of functions of real variables, and infinite series.

**551, 552. Introduction to Topology.** (3:3:0 ea.) Prerequisite: completion of or concurrent registration in Math. 541.

Axiomatic treatment of linearly ordered spaces, metric spaces, arcs, and Jordan curves, types of connectedness.

**585. Matrix Analysis.** (3:3:0) Prerequisite: Math. 322, 372, or 385.

Characteristic values, canonical forms, and functions of matrices, with applications.

**629. Teaching Mathematics in Secondary Schools.** (3:3:0) Offered on demand.

**631, 632. Complex Analysis.** (3:3:0 ea.) Prerequisites: Math. 332 and 542.

Offered on demand.

**634, 635. Theory of Ordinary Differential Equations.** (3:3:0 ea.) Prerequisites: Math. 434 and 542.

Offered on demand.

**641, 642. Functions of a Real Variable.** (3:3:0 ea.) Prerequisite: Math. 542.

**643R. Special Topics in Analysis.** (3:3:0 ea.) Prerequisites: Math. 541, 542.

Topics selected from continued fractions, stochastic processes, generalized functions, etc.

**645. Tensor Analysis.** (3:3:0) Prerequisite: Math. 244 or 542.

Offered on demand.

**647, 648. Theory of Partial Differential Equations.** (3:3:0 ea.) Prerequisites: Math. 436 and 542.

Offered on demand.

**651, 652. General Topology I, 2.** (3:3:0 ea.) Prerequisite: consent of instructor.

**653R. Special Topics in Geometry.** (3:3:0 ea.) Prerequisites: Math. 372 and 452.

Topics from  $n$ -dimensional projective and algebraic geometry, foundations, transformations, curves and surfaces, forms and sheaf theory.

**655R. Advanced Special Topics in Topology.** (3:3:0 ea.) Prerequisite: consent of instructor.

Offered on demand.

**661, 662. Functional Analysis.** (3:3:0 ea.) Prerequisite: Math. 632 or 642.

Offered on demand.

**671, 672. Modern Algebra.** (3:3:0 ea.) Prerequisites: Math. 371 and 372.

**675R. Special Topics in Algebra.** (3:3:0 ea.) Prerequisite: Math. 671.

Group theory; commutative algebra; homological algebra; ring theory; algebraic number theory.

**681. Linear Algebra.** (3:3:0) Prerequisites: Math. 371, 372.

Offered on demand.

**695R. Readings in Mathematics.** (1-2:1-2:0 ea.) Offered on demand.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)



## Microbiology

**Professors.** Beck, Bodily, Donaldson (chairman, 775 WIDB), Larsen, North, Sagers (graduate coordinator, 751 WIDB), Wright.

**Associate Professors.** Bradshaw, Burton, Jensen.

**Assistant Professor.** Johnson.

**Collaborator.** Bolick.

**Programs.** Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Entrance Examination Required.** None.

**Application Consideration Dates:** Same as Graduate School deadlines.

**Entry Times:** Any regular registration.

### Master of Science

**Prerequisites.** Adequate preparation for graduate work in the Department of Microbiology presupposes satisfactory training in the physical and biological sciences. If a student is deficient in foundation courses, opportunity will be given after entering Graduate School to correct these deficiencies; however, such a student will not be able to receive the advanced degrees in the minimum time required of more qualified candidates.

**Fields.** Genetics, medical technology, microbiology.

**Minors Permissible.** Any approved biological or physical science minor; Option II.

**Requirements:** Minimum of 24 semester hours plus thesis (6-hr. min.—699).

**Required Courses.** Micro. 331, 501, 511, 531, 551, 581, 691R, 699; one year of inorganic college chemistry; one semester of quantitative analysis; Chem. 351, 352, 353, 481, 484; Physics 201 and 202; and Math. 111. Many of these courses would normally be taken during a student's undergraduate training.

**Medical Technology Field.** A nonthesis M.S. degree program is offered to certified medical technologists by the Department of Microbiology.

### Doctor of Philosophy

**Prerequisites.** Master's degree in a biological or physical science.

**Fields.** Genetics, microbiology.

**Minors Permissible.** Any approved minor in biological or physical science.

**Requirements.** Minimum of 24 semester hours plus dissertation (18-hr. min.—799). Prior to selection of a dissertation subject and assignment to a research adviser, the student must pass a written qualifying examination in the following areas: (1) general microbiology, (2) pathogenic microbiology, (3) immunology, (4) virology, (5) bacterial physiology, and (6) microbial genetics. This examination will normally be given after one year of graduate study. It may be waived if the student has received the master's degree in microbiology at Brigham Young University. The courses and number of credit hours required for the Ph.D. degree will be determined by the advisory committee based upon the level of previous academic preparation of the student and his specific interests.

A student must pass a comprehensive written and oral examination prior to admission to candidacy for the Ph.D. degree. This examination will be taken not earlier than two semesters after completion of the qualifying examination. Prior to taking the comprehensive examination the student must have satisfied the language tool requirements and completed courses in differential and

integral calculus, Chemistry 461 and 462, and Micro. 641 and 661.

**Required Courses.** All classes required for a master's degree in microbiology, as listed above, plus differential and integral calculus, Chemistry 461 and 462, Micro. 641 and 661.

### Courses

**501. Pathogenic Microbiology.** (5:3:6) Prerequisite: Micro. 331 or consent of instructor.

Characteristics of pathogenic microorganisms—their isolation and identification.

**511. Immunology.** (4:2:6) Prerequisite: Micro. 501 or consent of instructor.

**521. Industrial Microbiology.** (2:2:0) Prerequisites: Micro. 331 and biochemistry.

**522. Industrial Microbiology Laboratory.** (1:0:3) Prerequisite: completion of or concurrent registration in Micro. 521.

**531. Virology.** (4:2:6) Prerequisite: Micro. 501 or 511.

**551. Advanced Microbiology.** (5:3:6) Prerequisites: Chem. 481 and 484 or consent of instructor.

**581. History of Microbiology.** (1:1:0)

**601. Pathogenesis of Infectious Disease.** (2:2:0) Prerequisites: Micro. 511 and consent of instructor.

**611. Advanced Immunology.** (2:2:0) Prerequisite: Micro. 511.

**631. Advanced Virology.** (2:2:0) Prerequisite: Micro. 531; Chem. 481 or equivalent.

**632. Cell and Tissue Culture Techniques.** (2:0:6) Prerequisites: Micro. 531; Chem. 481 or equivalent.

Advanced techniques utilized in cell and tissue culture procedures.

**641. Radioactive Tracer Techniques in Biology.** (3:1:6) Prerequisites: Physics 202 and consent of instructor.

**651R. Special Topics in Microbiology.** (1-2:Arr.:Arr.) Prerequisite: Micro. 551.

**661. Microbial Genetics.** (4:3:3) Prerequisites: Micro. 331, a course in general genetics, Chem. 481 or equivalent.

Molecular bases of genetics of bacteria and bacteriophages, including mechanisms of DNA transfer, uptake, recombination, replication, and mutation.

**671. Clinical Correlation.** (2:1:3) Bolick  
Correlation of laboratory data with the diagnosis, pathogenesis, course, and treatment of disease.

**691R. Graduate Seminar.** (1:1:0 ea.)

**695R. Research.** (Arr. ea.)

**699. Thesis for Master's Degree.** (Arr.)

**799. Dissertation for the Ph.D. Degree.** (Arr.)

## Music

**Professors.** Bradshaw (composer-in-residence), Davis, Earl, Goodman (chairman C-550-D HFAC), Halliday, H. Laycock, R. Laycock, Mason, Nibley, Nordgren (graduate coordinator E-554 HFAC), Sardoni, Williams, Woodward.

**Associate Professors.** Dalton, Gibbons, Keeler, Longhurst, Manookin, Randall, Stubbs.

**Assistant Professors.** Belnap, Foxley, Mathiesen, Robison, Unsworth.

**Programs.** Master of Music (M.M.), Master of Arts (M.A.), Doctor of Philosophy (Ph.D.).

#### Entrance Examinations Required.

1. Music Department Graduate Entrance Examination: presupposes the information and skills of two years of music theory and one year of upper division music history. Given on the day preceding registration (excluding Sunday) for the Fall Semester and Summer Term and at other times by special arrangement with BYU Testing Center (B-268 ASB).
2. Graduate Entrance Audition: for majors or minors in performance.
3. Doctoral Admissions Examination composed of the Advanced Music Test of GRE and an oral examination (required of doctoral students only).

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times:** Any regular registration.

### Master of Music

**Prerequisite.** A bachelor's degree in music performance or the equivalent is required of all applicants except those in a conducting specialty who must have a bachelor's degree in music education or equivalent. Grade-point average for undergraduate music classes must be B (3.0) or better.

**Prerequisite (conducting specialty):** A bachelor's degree in music education or evidence of sufficient training and experience in conducting and ability to play simple scores at the keyboard.

**Field.** Performance.

**Minors Permissible.** Option II only.

**Requirements.** Minimum of 32 semester hours, a scholarly paper, and a recital.

**Music Courses.** (except for conducting specialty) Music 566R (4 hours beyond bachelor's degree program); 613, 635, 660R (each semester); 693, 697R; and two classes from 638, 639, or 640; and 3 to 7 hours of electives.

**Required Courses for Conducting Specialty.** Music 613, 615 or 616, 620R and 621R (6 hours), 635, 648, 660R (4 hours), 694R, 697R, 2 hours of ensemble, and one class from 637, 638, 639, 640, or 675.

This degree program is for qualified students whose interests lie principally in performance.

### Master of Arts

**Prerequisite.** A bachelor's degree in music in respective majors or the equivalent.

**Fields.** Music education, musicology, music theory.\*

**Minors Permissible.** Option I or Option II.

**Requirements.** Minimum of 24 semester hours plus a six-hr. minimum of 698 or 699.

#### Required Courses

Music education: Music 605, 610, 612, 613, 635, 693, 699.

Musicology: Music 613, 635, 693, 699, and any 12 (Option II) or 15 (Option I) hours from the following classes: 636, 637, 638, 639, 640, and 675.

Music Theory: Music 613, 635, 673, 675, 686, 693, and 698 or 699.

\*A student majoring in music theory who has had substantial experience in composition may, with the permission of the Music Department graduate faculty, submit a major composition to fulfill the thesis requirement for the Master of Arts degree.

The Master of Arts degree is in preparation for (1) further study and research at the doctoral level; (2) teaching and/or supervision at the elementary, secondary, and junior college levels, and in private studios; (3) performance and composition; (4) background in many related fields, such as community recreation, therapy, church music, merchandising, broadcasting, and music criticism.

### Doctor of Philosophy

**Prerequisite.** A master's degree in music or the equivalent.

**Fields.** Music.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 68 semester hours plus dissertation (18-hr. min.).

**Required Courses.** Music 605, 613, 635, 693, 699 (or 697R or 698), 754, 785; 794R, 799; and any 15 hours from the following: 636, 637, 638, 639, 640, 675.

The Doctor of Philosophy degree is in preparation for junior college, college, university, conservatory teaching or administration; research or composition.

### Courses

**537. Music for Elementary School Teachers.** (2:2:0) Prerequisites: Music 345 or elementary teaching experience.

Davis

Experience in teaching various music activities in the elementary school.

**565R. Pedagogy.** (2:2:0 ea.) Prerequisite: advanced standing in performance.

Comprehensive study of performance pedagogy for major instrument or voice and supervised private teaching.

**566R. Applied Music Literature.** (2:2:0 ea.) Prerequisite: senior standing as a performance music major.

Intensive study of literature for the major instrument. Taken by senior and graduate students in performance, with sections for voice, piano, organ, and orchestral instruments.

**587, 588. Composition.** (3:3:0 ea.) Prerequisite: Music 296.

Bradshaw, Manookin

**601. Music in the Elementary School.** (2:2:0) Prerequisites: Music 345 and the equivalent of an elementary education teaching minor in music.

Davis, Law

**603. Music in the Junior High School.** (2:2:0) Prerequisite: Music 601.

Davis, Gibbons

**605. Influence of Music on Behavior.** (3:3:0) Prerequisite: general psychology, sociology, or equivalent.

Goodman, Mason

**610. Supervision and Administration of Music in the Public Schools.** (2:2:0)

Goodman, Mason

**612. Music Education in Society.** (3:3:0) Prerequisites: Music 484, 485, or equivalent.

Davis, Goodman

**613. Basic Concepts in Music Education.** (2:2:0)

Davis, Goodman, Mason

Required of all candidates for graduate music degrees.

**615. Vocal Methods, Materials, and Resources.** (2:2:0) Prerequisite: Music 479 or equivalent.

Halliday, Woodward

**616. Instrumental Methods, Materials, and Resources.** (2:2:0) Prerequisite: Music 479 or equivalent.

Goodman

**620R. Advanced Instrumental Conducting.** (2:2:3 ea.) Prerequisites: Music 296, 374, 375, 485, or equivalent.

R. Laycock, Sardoni



**621R. Advanced Choral Conducting.** (2:3:3 ea.) Prerequisites: Music 166, 296, 364, 374, 375, 485, or equivalent. Halliday, Woodward

**625R. Summer Music Clinic.** (1-2:4:4 ea.) (Two weeks during clinic.)

May be counted as either music education or applied music.

**630R. Special Lectures in Music Education.** (1-3:Arr.:Arr. ea.) Prerequisite: certification in music plus teaching experience.

**635. Musical Research Techniques.** (3:3:0) Prerequisite: graduate standing or consent of instructor. Mathiesen, Staff

Required of all candidates for graduate music degrees. Should be taken in first semester of graduate work.

**636. Music in the Middle Ages.** (3:3:1) Prerequisites: Music 484, 485, or equivalent. Powley

**637. Music in the Renaissance.** (3:3:0) Prerequisites: Music 484, 485, or equivalent. Powley

**638. Music in the Baroque Era.** (3:3:0) Prerequisites: Music 484, 485, or equivalent. Powley

**639. Music in the Classic Period.** (3:3:0) Prerequisites: Music 484, 485, or equivalent. Mathiesen

**640. Music in the Romantic Period.** (3:3:1) Prerequisites: Music 484, 485, or equivalent. Mathiesen

**641R. Special Lectures in Musicology.** (1-3:Arr.:Arr. ea.) Prerequisites: Music 484, 485, or equivalent. Mathiesen, Powley

**648R. Collegium Musicum.** (1:0:3 ea.) Prerequisite: consent of director.

Practical experience in designing programs, outlining music, and preparing program notes for music from the medieval to modern times.

**652. History of Notation and Paleography.** (3:3:0) Prerequisites: Music 484, 485, 636, or equivalent. Powley

**656. Hymnology.** (2:2:0) Prerequisites: Music 484, 485, or equivalent. Earl

Offered 1976-77 and alternate years.

**660R. Graduate Private Instruction.** (2:1:0 ea.) Prerequisite: completion of undergraduate applied proficiency requirements and audition.

Fifteen 45-minute lessons per semester. Three hours of practice required per day. Special fee. (For instructors see Music 159R.)

**663. Solo Recital.** (2:1:0) Williams

One period per week with private teachers, 2-3 hours per day, plus public performance of the recital. Required of all graduate students minoring in performance. Special fee.

**673. Advanced Problems in Musical Structure.** (3:3:0) Prerequisites: Music 472, 491. Bradshaw, Manookin

**675. Music of the Contemporary Period.** (3:3:0) Prerequisites: Music 484, 485, or equivalent. Mathiesen

A survey of twentieth-century music, including its relationship to the past and its sociological, psychological, and philosophical implications for the present day.

**686. Pedagogy of Music Theory.** (3:3:0) Prerequisite: Music 296. Nordgren

**687, 688. Composition.** (3:3:0 ea.) Prerequisite: Music 588 or equivalent. Bradshaw, Manookin

**693. Proseminar in Music.** (2:2:0) Prerequisites: Music 484, 485, 635, or equivalent, and approval of advisory committee. Mathiesen, Staff

Required of all candidates for graduate music degrees. Should be taken in second semester of graduate work.

**694R. Independent Readings.** (1-3:Arr.:Arr. ea.) Prerequisite: Music 693 or equivalent.

**697R. Recital for Master of Music Degree.** (4:Arr.:Arr. ea.) Prerequisites: approval of advisory committee and graduate music faculty.

Required of all Master of Music degree candidates. Includes the preparation of public recital and a research paper on specific aspects of the recital. Special fee.

**698. Composition for Master's Degree.** (2-6:Arr.:Arr.) Prerequisite: approval of the Music Department graduate faculty based upon evidence of ability in composition as manifested in a preliminary work. Bradshaw

To be submitted by candidates for the master's degree majoring in theory with a composition emphasis.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Prerequisite: approval of the Music Department graduate faculty.

Candidates for the master's degree are required to show competence in writing and research before work is begun on the thesis.

**753. Advanced Problems in Notation.** (3:3:0) Prerequisite: Music 652. Powley

**754. History of Musical Instruments.** (3:3:0) Prerequisites: Music 484, 485, or equivalent.

Offered alternate years.

**785. Historical Aspects of Music Theory.** (3:3:0) Prerequisite: Music 296. Nordgren

Offered alternate years.

**794R. Seminar in Music.** (1-3:Arr.:Arr. ea.) Prerequisites: Music 635, 693, or equivalent, and approval of graduate advisory committee.

**799. Dissertation for Ph.D. Degree.** (Arr.) Prerequisite: approval of graduate advisory faculty.

## Nursing

**Professor.** Cope.

**Associate Professors.** Van Dimmelen, Wood (chairman, 2240-A SFLC).

**Assistant Professors.** Alley, Bethers, Drake, Harris, Kensington, Leifson, Lyons, Marshall, May, Murphy, Riddle, Willhite.

**Program.** Master of Nursing.

**Entrance Examinations Required.** Verbal and quantitative portions of the Graduate Record Examination.

**Applications Consideration Date:** Same as Graduate School deadlines.

**Entry Times:** Any regular registration.

## Master of Nursing

**Prerequisites.** A baccalaureate degree in nursing from a N.L.N. accredited program and current R.N. licensure in any state. The following undergraduate courses or equivalent: (Stat. 221, Zool. 361, Biochem. 281, and Nursing 306).

**Fields.** Clinical specialization in cardiovascular nursing, family nursing, neurological nursing, or oncological nursing.

**Minors Permissible.** Option 11.

**Requirements.** Minimum of 30 semester hours plus thesis (6-hr. minimum).

**Required Courses.** All specialties: Nursing 500, 504, 506, 508, 512, 517, plus courses in the specialty area.

## Courses

For course numbers, titles, credit hours, and description information, contact the Department of Nursing, 2240 SFLC.

## Organizational Behavior

**Professors.** Dyer, Dalton, Daniels (psychology), Moffitt.  
**Associate Professors.** Ritchie, Thompson (chairman, A-263 JKBA).  
**Assistant Professors.** Cherrington, Wright (political science).

**Program.** Master of Arts (M.A.).

**Entrance Examination Required.** Admission test for graduate study in business offered by the Educational Testing Service, Box 966, Princeton, N.J. In addition an oral screening examination will be conducted by members of the faculty and a team of current graduate students. If a candidate lives a considerable distance from Provo, he may make special arrangements with the chairman for a different screening program.

**Application Consideration Dates.** Priority consideration will be given to applications before March 15. Late applications will be considered until June 1.

**Entry Times.** Fall Semester only.

## Master of Arts

**Prerequisites.** It is expected that the student will have background or training in some of the following areas: research methods, statistics, psychology, sociology, business management, or related fields. Previous work and business experience are also desired.

**Field.** Organizational behavior.

**Minors Permissible.** Option I or Option II.

**Requirements:** Minimum of 50 semester hours, an internship, plus a research report. Program requires four full-time semesters.

**Required Courses.** Org. Behav. 610, 640, 650, 670, 680, 689R, plus additional business or social science courses (see departmental brochure).

The Department of Organizational Behavior has as a major objective the development of persons who will be working in organizations as professionals in the areas of organization research and development, management training and development, personnel management, or industrial relations, or who will seek careers in teaching or research in the fields in organizational behavior.

## Courses

**522. Management Development 2: Case Histories and Practicum Interpersonal Relations.** (3:3:0) Prerequisite: Org. Behav. 321.

Application of skills in problem diagnosis, empathy, and communications in two-person settings—cases, individual student commitment, and involvement.

**523. Leadership in Organizations: Case Histories and Practicum.** (3:3:0) Prerequisite: Org. Behav. 321.

Solution of "live" leadership problems from student experiences through the use of skills, leadership theory, and disciplines.

**606. Organizational Behavior and Administration.** (3:3:0)

Current theories of organization and how administrators and managers can develop and improve organizational functioning.

**610. Management Development: Philosophy and Personal Style.** (3:2:2)

A laboratory experience designed to help the potential manager develop a philosophy of management and improve his personal management style.

**640. Behavioral Approaches to Organizational Processes and Structures.** (3:3:0) Prerequisite: Org. Behav. 321 or equivalent, or consent of instructor.

Review of concepts and research findings from psychology, social psychology, sociology, and cultural anthropology used in understanding behavior and implications in organizations.

**650. Research Methods in Organizational Diagnosis and Evaluation.** (3:3:0) Prerequisites: two courses in statistics and/or research methods; or consent of instructor.

Adaptation of behavioral science research methods to problems of organizational development as applied to evaluation and action research strategies.

**660R. Advanced Seminar in Organizational Behavior.** (2:2:0 ea.) Prerequisite: consent of instructor.

Focus on topics and problems varies each semester. Examples are conflict, resolution, power and influence, intergroup relations.

**669. Readings in Organizational Behavior.** (1-3:0:0)

A reading and discussion course, with direction from a faculty member in areas of the student's interest.

**670. The Dynamics of Organization Change: Interventions and Strategies.** (3:3:0) Prerequisite: Org. Behav. 640 or equivalent.

Examination of forces operating to induce or resist change, and the strategy and tactics of change.

**672. The Consultative Process.** (3:3:0) Prerequisites: Org. Behav. 640, 670, or equivalent; or consent of instructor.

Concentration on third-party role in group development, educational process, conflict resolution, and intervention strategies.

**675. Theory and Method of Laboratory Training.** (3:2:2) Prerequisites: Sociol.-Psych. 357; Org. Behav. 640, 670, or equivalent; or consent of instructor.

Study of research findings from studies of behavior modification to particular problems in training behavioral skills.

**679. Practicum in Organizational Development.** (6-9:2:28) Prerequisite: consent of instructor and advisory committee.

One semester in an organization on a development project under the supervision of a faculty member and professional person within the organization.

**680. Organization Behavior Research Report.** (3:2:2) Prerequisite: consent of instructor.

Special research projects in organizations focusing on group structure functions, leadership, and the control to increase group effectiveness.

**689R. Professional Development Seminar.** (2:0:4 ea.) Prerequisite: consent of instructor and advisory committee.

Integration and synthesizing of learning experiences through participation on a learning team.

## Philosophy

**Professors.** Madsen, Riddle, Yarn.

**Associate Professors.** Carter, Rasmussen, Warner.

**Assistant Professors.** Reynolds (chairman, 30 JSB).

## Minor Only

**Prerequisites.** Lower-division courses prerequisite to those chosen for the minor.

**Requirements.** For master's level, 9 semester hours; for doctoral level, 15 semester hours.



**Required Courses.** Those specified by philosophy representative on the student's advisory committee.

## Courses

305. Intermediate Logic. (3:3:0)

311. Philosophy of Language. (3:3:0)

312. Philosophy of Mind. (3:3:0)

315. Philosophy of Religion. (3:3:0)

352. Aesthetics. (3:3:0)

354. Philosophy of the Natural Sciences. (3:3:0)

355. Philosophy of the Behavioral and Social Sciences. (3:3:0)

371R. Topics in Philosophy. (2-5:2-5:0 ea.)

372R. Figures in Philosophy. (2-5:2-5:0 ea.)

373R. Historical Movements in Philosophy. (2-5:2-5:0 ea.)

448R. Readings in Philosophy. (1-4:1-4:0 ea.)

501R. Graduate Seminar. (2-5:2-5:0 ea.)

Intensive analysis of a selected topic, figure, or movement in philosophy, as announced each semester in the class schedule.

505. Logic and the Philosophy of Mathematics. (4:3:0)  
Prerequisite: Phil. 205 or consent of instructor.

Philosophical issues in logic, including: formal theories and definitions, limitations of the axiomatic method, and logic and set theory in the foundations of mathematics.

648R. Directed Readings in Philosophy. (1-4:1-4:0 ea.)

## Physical Education

**Professors.** Allsen, Bangerter, Call, Hartvigsen, Holbrook, Jarman, C. Jensen, Roundy (chairman, 270 SFH), Shaw (graduate coordinator, 221-F RB).

**Associate Professors.** Fisher, Francis, Jacobson, Johnson, Jones, McGown, Watts.

**Assistant Professors.** Barker, Bestor, Harrison, Hirst, Rasmus.

**Programs.** Master of Arts (M.A.), Master of Science (M.S.), Doctor of Education (Ed.D.).

**Entrance Examinations Required.** For the doctoral program, the qualitative and quantitative sections of the Graduate Record Examination.

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** A bachelor's degree with a major in physical education involving knowledge and competencies equivalent to those required in the undergraduate major program at Brigham Young University. Competency examinations in skill, fitness, and knowledge will be administered to entering graduate students. Students will be counseled to strengthen any areas of weakness identified in the examinations.

**Fields.** Dance, professional leadership.

**Minors Permissible.** Any approved minor.

### Requirements

1. With no project, 36 semester hours.

2. With a project, 24 semester hours plus project (6 semester hours).

### Required Courses

1. With no project, 12 hours as follows: P.E. 692; one of the following: P.E. 662, 661, or 640; three of the following: P.E. 547, 642, 645, 647, or 648; one of the following: P.E. 601, 610, or 670.

2. With a project, P.E. 692.

## Master of Science

**Prerequisites.** A bachelor's degree with a major in physical education involving knowledge and competencies equivalent to those required in the undergraduate major program at Brigham Young University.

**Fields.** Analysis of human motions, professional leadership.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699).

**Required Courses.** P.E. 635, 692.

## Doctor of Education

**Prerequisites.** Two years of successful professional experience.

**Fields.** Analysis of human motions, professional leadership.

**Minors Permissible.** Any approved minor.

**Requirements.** Minimum of 70 semester hours plus a dissertation (12-hr. min.—799).

### Required Courses

1. All courses in one of the two following cores: Scientific core (18 semester hours): P.E. 547, 631, 642, 645, 646, 647, 648, 671, 692; Administration core (18 semester hours): P.E. 601, 610, 640, 661, 662, 663, 670, 692.

2. Supporting field (20 semester hours).

3. Electives chosen from graduate courses in physical education or related areas.

4. All candidates must demonstrate competency in statistics of at least the level demanded by P.E. 635.

## Courses

547. Advanced Corrective Physical Education. (2:2:1)  
Prerequisite: P.E. 446. Call

Techniques of postural evaluation, muscle testing, therapeutic exercises, and relaxation; extent and limitations of the physical educator's responsibility for recognition of divergent conditions and referral procedures.

570. Teaching Progression in Individual Sports. (2:4:0)  
Jones

Materials, methods, and teaching progression in individual sports, including archery, badminton, bowling, tennis, and golf.

571. Teaching Progression in Team Sports. (2:2:2)  
Hirst, Jones

Materials, methods, and teaching progression in team sports.

575. Materials and Methods for Secondary Teachers. (2:1:2)  
Harrison, Jones

576R. Workshop in Fitness and Sport. (1-4:Arr.:Arr. ea.)  
Prerequisite: undergraduate major in physical education or equivalent. Jacobson, Roundy

Designed to give physical education teachers an experience in fitness and sport that will upgrade their skill, knowledge, and competence.

587. Modern Dance Composition, Advanced. (1:0:4)

Advanced principles of composition, including elements of space, motion, energy, and time.

**588. Modern Dance Performing Techniques.** (2:0:6)  
Prerequisites: P.E. 382, 385.

Advanced techniques, with combinations of movement and pattern to further dance as a performing art.

**589A,B,C. Workshop in Modern Dance.** (1-2:Arr.:0 ea.)

**601. Problems in Physical Education.** (2:3:0) Bangerter  
Identification and interpretation of the nine generalized problems in physical education.

**610. Philosophy of Physical Education.** (2:2:0) Holbrook  
Interpretations, beliefs, and concepts underlying the profession of physical education.

**631. Problems in Athletic Conditioning.** (2:2:4) Allsen  
Application of scientific principles to problems in athletic conditioning.

**633. Physical Education for the Mentally Retarded.** (2:2:0) Prerequisite: bachelor's degree in physical education. Call

Theory, concepts, and programs in physical education for trainable and educable mentally retarded.

**635. Research Design in Physical Education.** (2:2:1) Prerequisites: P.E. 464 or equivalent. Roundy

**640. Curriculum Construction in Physical Education.** (2:2:0) Johnson  
Curriculum problems for elementary, secondary, and college physical education programs.

**642. Mechanical Analysis of Activities.** (2:2:0) Bangerter, Johnson  
Analysis of the mechanics of movement in various activities to develop the highest degree of skill.

**645. Functional Anatomy and Kinesiology.** (2:2:0) Prerequisites: Zool. 105, 260, 261; P.E. 341, 344, 446, 449, or equivalent. Call, Francis  
Functional applied anatomy and kinesiology for physical education students.

**646. Laboratory Methods and Procedures.** (2:2:0) Prerequisites: P.E. 341 and 344 and concurrent enrollment in 674. Fisher  
Basic techniques and procedures used in human performance laboratories.

**647. Advanced Physiology of Activity.** (2:2:0) Prerequisites: P.E. 341, 344. Fisher  
Adjustments made by the body to physiological stress.

**648. Theory of Motor Learning.** (2:2:0) McGown  
Theories and methods of learning physical skills.

**661. Supervision in Physical Education.** (2:2:0) Jarman  
A consideration of the theory and practice upon which successful supervision in P.E. is based.

**662. Administration and Public Relations.** (3:3:0) Hartvigsen  
Administrative and public relations problems at all school levels: local, state, and national.

**663. Planning Facilities.** (2:2:0) Jarman  
Basic planning for facilities for school and community physical education and recreation programs.

**670. History of Physical Education.** (3:3:0) Holbrook  
History of physical education from ancient civilization to the present day.

**671. Psycho-Sociological Implications of Sport.** (2:2:0) Prerequisites: Psych. 111, 450, or equivalent. Allsen  
Analysis of the psycho-sociological implications of sport as it affects the participant and the spectator.

**673. Physical Education in the Elementary School.** (2:3:0) Holbrook  
Curricular interrelationships, and content materials in accomplishing educational results. For teachers, administrators, and supervisors.

**674A,B,C. Workshop in Physical Education in the Elementary Schools.** (1:combination of 40 hrs. ea.)

Materials, methods, and teaching progression in physical education for the elementary school. Offered on demand.

**691. Graduate Admission Seminar.** (1:2:0) Prerequisite: provisional acceptance in the Ed.D. program. Roundy

Evaluation of the student's aptitudes, leadership qualities, and ability to successfully complete an Ed.D. program in physical education.

**692. Research Methods in Physical Education.** (2:3:0) Roundy

**694. Individual Study.** (2:1:1) Holbrook  
Readings from recently published professional literature.

**698. Field Project, Master's Degree.** (1-6:0:Arr.) Roundy

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Roundy

**797R. Individual Research in Physical Education.** (2-6:Arr.:Arr. ea.) Prerequisites: undergraduate major in physical education; matriculation for graduate study in the department. Roundy

**799. Dissertation for the Ed.D. Degree.** (12:Arr.:Arr.)

## Physics and Astronomy

**Professors.** Ballif, Barnett (graduate coordinator, 187 ESC), Bass, Decker, Dibble, Dixon, Dudley, Eastmond, Fletcher (emeritus), A. Gardner, J. Gardner, Hales (emeritus), Hansen, Harrison (chairman, 296 ESC), A. Hill, M. Hill, Jones, Larson, McNamara, Merrill, Nelson, Vanfleet.

**Associate Professors.** Evenson, Jensen, Mason, Palmer, Rasband, Strong, Woodford.

**Assistant Professors.** Christensen, Hatch, Knight.

**Programs.** Master of Arts (M.A.), Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Prerequisites for the Ph.D. Degree.** Satisfactory completion of the following courses or their equivalents: Physics 121, 122, 221, 222, 316, 317, 318, 321, 322, 341, 342, 431, 471, 551, 552, and Math. 214, 434.

**Prerequisites for the M.S. Degree.** Satisfactory completion of the following courses or their equivalents: Physics 121, 122, 221, 222, 316, 317, 318, 321, 322, 341, 342, and Math. 214, 434.

**Prerequisites for the M.A. Degree.** Satisfactory completion of the following courses or their equivalents: Physics 121, 122, 221, 222, 300, 316, 317, 321, 322 (or 341 and 386), and Math. 214, 434.

Any deficiencies in formal course work at the undergraduate level will be considered at registration time, and an appropriate program for removing these deficiencies will be developed by the student and his sponsor or adviser.

**Special Examinations Required.** Graduate Record Examination scores (both aptitude and advanced physics) are required of all applicants for admission.

**Application Consideration Dates.** Same as Graduate School deadlines. Applications should be submitted early (April 1, for fall registration) for prime consideration relative to scholarships or teaching assistantships.

**Entry Times.** Any regular registration.

**Master of Arts**

**Field.** Physics teaching emphasis.



**Minors Permissible.** Education or Option II.

**Requirements.** Minimum of 24 hours plus thesis (6-hr. min.—699).

**Required Courses.** None. (This program differs from the M.S. program in its prerequisites.)

**M.A.-3 Program.** One mode of completing the M.A. degree is an M.A.-3 program for secondary and junior college teachers. This must begin in the junior year and leads to both B.A. and M.A. degrees in Physics as well as teacher certification. Prerequisites to this three-year program are Math. 111, 112 and the general education requirements for other than physical sciences and mathematics. A typical M.A.-3 program follows:

Junior Year: Chem. 105; Ed. 301; Math. 113, 214, 301, 302, 371, 434; Physics 214, 317.

Senior Year: Ed. 310, 403, 415; Health 362; Physics 222, 300, 316, 318, 321, 511; Phys. Sci. 377, 479.

Graduate Year: Physics 341, 386, 551, 552, another two-semester physics series, 699.

Suggested Minors: Math. 387, 501, 502; or Ed. 640, 642, 644R.

## Master of Science

**Fields.** Acoustics, astrophysics, atomic physics and spectroscopy, biophysics, nuclear physics, planetary and space physics, plasma physics, solid-state physics, theoretical physics.

**Minors Permissible.** Recommended minor in mathematical physics, which may be satisfied with Physics 517, 518, and 621; also Option II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699).

**Required Courses.** None.

The Master of Science degree often is sought by those who intend to continue on for the Ph.D. degree, but it also serves as a terminal degree for many who intend to work in industrial or governmental research or teaching. Those intending to enter research can maintain breadth or obtain some degree of specialization by selecting appropriate graduate or undergraduate courses where this can be done in conformity with the regulations of the Graduate School.

## Doctor of Philosophy

**Degrees.** Two degrees are offered: physics and also physics and astronomy.

**Prerequisites.** Courses to satisfy the language requirements. Students may fulfill the language requirement under Option III as described under the general University requirements for the Ph.D. degree. If this option is selected the student must present A or B grades in Comput. Sci. 131 and 6 hours selected from Physics 617, 618; Math. 371, 411, 512, 645, 647, 648. (These courses must be in addition to courses used to fulfill course work requirements listed under "Required Courses.")

**Fields.** Acoustics, astrophysics, atomic physics and spectroscopy, biophysics, nuclear physics, planetary and space physics, plasma physics, solid-state physics, theoretical physics.

**Minors Permissible.** See "Required Courses" below.

### Requirements

1. Minimum of 48 hours in approved formal course work, exclusive of graduate seminars (see course 591R), plus dissertation (18-hr. min.—799).

2. Successful completion of comprehensive written examinations covering the required courses listed below and an oral examination covering the two general fields selected under fields listed below (see under "Required

Courses"). Normally these examinations will be taken toward the end of the second year.

3. Before admission to candidacy, tentative acceptance as a research student by a member of the faculty of the Department of Physics and Astronomy.

**Required Courses.** Physics degree: 517, 518, 621, 641, 642, 651, 652; physics and astronomy degree: 517, 518, 527, 528, 621, 651, 652. A graduate seminar each semester of residence. At least 12 credit hours in that field listed below which is most closely related to the field of the student's research to constitute a major and 12 credit hours in a second field to constitute a minor. No duplication between these courses and those listed above is permitted.

1. Acoustics: Physics 561, 562, 565R, 566R, 623, 631, 681.
2. Astrophysics: Physics 527, 528, 529, 611, 612, 627, 628, 671, 711R.
3. Atomic physics and spectroscopy: Physics 527, 528, 631, 632, 671, 672, 711R.
4. Nuclear physics: Physics 555, 581, 631, 655, 656, 751, 752, 711R.
5. Plasma physics: Physics 536, 537, 623, 631, 632, 645, 646, 711R.
6. Solid-state physics: Physics 581, 623, 631, 681, 682, 711R.
7. Theoretical physics: Physics 617, 618, 625, 626, 632, 711R, 751, 752.
8. Planetary and space physics: Physics 536, 537, 631, 645, 646, 671, 672, 711R.
9. Physics group for physics and astronomy degree only: Physics 536, 537, 625, 626, 645, 646, 655, 656, 711R (6 hrs.); 631, 632, 641, 642 (6 hrs.).

The student whose research is in acoustics or biophysics may, with the approval of his committee, construct a 12-hour major or minor which includes courses outside the department.

## Courses

**300. Philosophical Foundations of Modern Physics.** (3:3:0) Prerequisite: Physics 221 or equivalent.

**316. Atomic and Nuclear Physics Laboratory.** (1:0:3) Prerequisite: completion of or concurrent registration in Physics 222.

**317, 318. Elementary Methods in Theoretical Physics.** (3:3:0 ea.)

**321, 322. Mechanics.** (4:4:0 ea.) Prerequisite: Physics 317.

**341, 342. Electricity and Magnetism.** (3:3:0 ea.) Prerequisite: Physics 317.

**386. Advanced Experimental Techniques.** (2:1:5)

**387. Advanced Physics Laboratory.** (2:1:3) Prerequisite: Physics 386 or equivalent.

**391, 392. Seminar in Current Physics.** (1:1:0 ea.) Prerequisite: consent of instructor.

**431. Thermal Physics.** (3:3:0)

**441. Electronics for Physicists.** (4:3:3)

**471. Optics and Electromagnetic Theory.** (3:3:0)

**497R. Introduction to Research.** (1-3:0-2-6 ea.)

**511. Introduction to Theoretical Physics.** (3:3:0) Prerequisite: Math. 434 or equivalent.

Basic principles of physics, with emphasis on their mathematical formulation. Topics treated vary from year to year.

**513R. Special Topics in Contemporary Physics.** (1-3:1-3:0 ea.) Prerequisite: consent of instructor.

Course content varies from year to year. Subject mat-

ter will generally be related to recent developments in physics.

**517, 518. Mathematical Physics.** (3:3:0 ea.) Prerequisite: Physics 318 or equivalent.

Topics in modern theoretical physics, including applications of matrix and tensor analysis and linear differential and integral operators.

**527, 528. Introduction to Astrophysics.** (3:3:0 ea.) Prerequisite: consent of instructor.

Fundamental principles and observational techniques of astrophysics.

**529. Observational Astrophysics.** (3:3:0) Prerequisites: Physics 527, 528.

Survey of important areas of current research in modern observational astrophysics.

**536, 537. Space and Planetary Physics.** (3:3:0 ea.) Prerequisite: consent of instructor.

Topics will include solar physics, interplanetary fields, atmospheres of earth and planets. Offered on sufficient demand.

**551. Elements of Quantum Theory.** (3:3:0) Prerequisites: Physics 221; Math. 434; or equivalent.

Analytical foundations of quantum mechanics; applications from atomic and molecular spectroscopy, quantum statistics, solid state physics, etc.

**552. Elements of Nuclear Theory.** (3:3:0) Prerequisite: Physics 551 or equivalent.

Foundations of nuclear physics considered in a quantum theory context; nuclear scattering, radioactivity, nuclear reactions, nuclear models, elementary particles, etc.

**555. Nuclear Reactor Physics.** (3:3:0) Prerequisite: Chem. Eng. 582 or consent of instructor.

Introduction to neutron physics in multiplying and non-multiplying media; diffusion and slowing down of neutrons; multigroup reactor theory.

**557. Nuclear Reactor Physics Laboratory.** (1:1:2) Prerequisite: Physics 555.

Laboratory experiments in neutron and nuclear reactor physics; reactor operation; cross-section, neutron age, and diffusion parameter measurements.

**561. Fundamentals of Acoustics.** (4:4:0)

General consideration of the generation, transmission, and reception of sound. Discussion of vibrating systems, properties of elastic media, mechanical and electrical energy, and radiation.

**562. Acoustical Measurements.** (2:0:4) Prerequisite: completion of or concurrent registration in Physics 561.

Selected experiments in acoustics.

**565R. Acoustics of Music and Speech.** (3:3:0 ea.) Prerequisite: Physics 561 or consent of instructor.

Content alternates between topics in music and topics in speech. Sound production and perception; techniques for analysis and synthesis; computer modeling; machine recognition; ensemble effects. Offered on sufficient demand.

**566R. Architectural Acoustics and Noise.** (3:3:0 ea.) Prerequisite: Physics 561 or consent of instructor.

Content alternates between topics in architectural acoustics and topics in noise. Computer modeling of enclosures; techniques for measuring noise spectra; room design; noise control. Offered on sufficient demand.

**581. Solid-State Physics.** (3:3:0) Prerequisites: Physics 431 and 551.

Introduction to solid-state physics for students in physics, chemistry, geology, and engineering. Survey of phenomena occurring in solids, and important physical concepts by which these phenomena are understood.

**591R. Seminar.** ( $\frac{1}{2}$ -1: $\frac{1}{2}$ -1:0 ea.)

Required of all graduate students every semester in residence.

**611, 612. Astrophysics.** (3:3:0 ea.) Prerequisite: consent of instructor.

The theory of stellar atmospheres and interstellar matter. Offered on sufficient demand.

**617. Advanced Topics in Theoretical Physics.** (3:3:0)

Applications of tensor analysis, differential geometry, and differential forms to various topics in physics, such as mechanics, optics, relativity, and fluid dynamics.

**618. Advanced Topics in Theoretical Physics.** (3:3:0)

Symmetry principles in quantum physics, emphasizing group theory; applications to solid-state, nuclear physics, relativity, and quantum field theory.

**621. Dynamics.** (3:3:0) Prerequisite: Physics 322.

Advanced treatment of classical mechanics, including Lagrange's and Hamilton's equations, rigid body motion, and canonical transformations.

**623. Dynamics of Continuous Media.** (3:3:0) Prerequisite: Physics 621.

The mechanics of systems with an infinite number of degrees of freedom. Topics include elasticity and hydrodynamics. Offered on sufficient demand.

**625. Theory of Relativity.** (3:3:0) Prerequisite: Physics 621.

Review of special relativity. General relativity, with applications to modern astrophysics. Offered on sufficient demand.

**626. Relativistic Astrophysics.** (3:3:0) Prerequisite: Physics 625.

Applications of general relativity to modern astrophysics, including gravitational collapse, black holes, cosmological models, gravitational waves, etc.

**627, 628. Advanced Topics in Astrophysics.** (3:3:0 ea.) Prerequisite: consent of instructor.

Internal structure of stars; galactic structure. Offered on sufficient demand.

**631, 632. Statistical Mechanics.** (3:3:0 ea.)

Advanced thermodynamics; classical statistical mechanics; quantum statistics; transport theory.

**641, 642. Mathematical Theory of Electricity and Magnetism.** (3:3:0 ea.) Prerequisite: Physics 342.

Advanced electrostatics and magnetostatics; Maxwell's equations and electromagnetic waves; relativistic electrodynamics; radiation theory; interaction of matter with electromagnetic fields.

**645, 646. Plasma Physics.** (3:3:0 ea.) Prerequisites: Physics 431, 621, 642.

A study of the plasma state of matter, including a description both in terms of individual particles and in terms of a fluid, with applications. Offered on sufficient demand.

**651, 652. Quantum Mechanics.** (3:3:0 ea.) Prerequisites: Physics 518, 551.

Nonrelativistic quantum mechanics logically developed, with applications.

**655, 656. Nuclear Physics.** (3:3:0 ea.) Prerequisite: Physics 552.

Fundamental properties of nuclei, nuclear forces, nuclear models, electromagnetic properties of nuclei, particle radioactivity, nuclear reactions, and interaction of radiation with matter. Offered on sufficient demand.

**671. Atomic and Molecular Spectroscopy.** (3:3:0) Prerequisite: consent of instructor.

Series and multiplet atomic spectra and rotational, vibrational, and electronic band spectra; determination of atomic and molecular structure.

**672. Observation and Analysis of Spectra.** (3:1:4) Prerequisite: Physics 671 or consent of instructor.

Analysis of optical spectra, with instrumentation and experimentation, including stellar spectroscopic techniques.



**681, 682. Modern Theory of Solid State.** (3:3:0 ea.)  
Prerequisites: Physics 581, 651.

Quantum mechanical theory of solids, emphasizing the unifying principles of symmetry, energy-band theory, dynamics of electrons and of periodic lattices and co-operative phenomena.

**697R. Research.** (Arr. ea.)

**699. Research and Thesis for Master's Degree.** (Arr.: Arr.:Arr.)

**711R. Advanced Topics in Physics.** (1-3:3:0 ea.) Prerequisite: consent of instructor.

Course content varies from year to year. Special topics in theoretical and experimental physics are treated.

**751, 752. Advanced Quantum Theory.** (3:3:0 ea.) Prerequisite: Physics 652 or consent of instructor.

Topics in relativistic quantum mechanics, including quantum field theory.

**797R. Research.** (Arr. ea.)

**799. Research and Dissertation for Ph.D. Degree.** (Arr.)

## Political Science

**Distinguished Professor.** Grow.

**Professors.** Farnsworth, Hickman, Hillam (chairman, 270 MSRB), Mabey (graduate coordinator, 274 MSRB), Melville, Midgley, Reeder.

**Associate Professors.** Buckwalter, Morrell, Slover, Snow, Sorensen, Taylor, Tullis.

**Assistant Professors.** Bohn, Williams, Wright.

**Program.** Master of Arts (M.A.).

**Entrance Examinations Required.** Graduate Record Examination (general and political science sections). All international students whose native language is not English are required to take the TOEFL.

**Application Consideration Dates.** Same as Graduate School.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** Fifteen undergraduate semester hours in political science or equivalent as approved by committee.

**Field.** Political science.

**Requirements.** 24 semester hours plus thesis (6-hr. minimum), a written comprehensive exam upon or near completion of course work and prior to writing thesis, and an oral defense of the thesis.

**Required Courses.** A graduate student's program will be determined in consultation with his committee prior to registration. Two seminars are recommended.

## Courses

**300. Political Inquiry.** (3:2:1) Prerequisites: Pol. Sci. 110, 150; completion of or concurrent registration in Pol. Sci. 170.

**301. The Logic of Political Inquiry.** (3:3:0)

**302. Moral Foundations of Politics.** (3:3:0)  
Midgley, Sorensen

**303. Empirical Political Theory.** (3:3:0) Buckwalter

**304. Western Political Heritage-Ancient.** (3:3:0)  
Midgley, Sorensen

**305. Western Political Heritage—Modern.** (3:3:0)  
Midgley, Sorensen

**307. American Political Heritage.** (3:3:0)  
Midgley, Sorensen

**309R. Topics in Political Philosophy.** (3:3:0 ea.)  
Midgley, Sorensen

**310. The United States Political System.** (3:3:0) Prerequisite: Pol. Sci. 110. Buckwalter, Grow, Melville

**311. State and Local Government and Politics.** (3:3:0) Prerequisite: Pol. Sci. 110. Grow, Williams

**312. Urban Government.** (3:3:0) Williams

**313. Parties and Pressure Groups in the U.S.** (3:3:0) Prerequisite: Pol. Sci. 110. Grow, Melville

**314. The United States Presidency.** (3:3:0) Melville

**315. American Legislative Systems.** (3:3:0) Prerequisite: Pol. Sci. 110. Buckwalter, Grow

**319R. Topics in American Government and Politics.** (3:3:0 ea.) Buckwalter, Slover, Grow, Melville, Williams, Tullis

**329R. Topics in Political Behavior.** (3:3:0 ea.) Taylor, Sorensen, Buckwalter, Farnsworth, Tullis

**330. Introduction to Public Administration.** (3:3:0)  
Grow, Slover

**339R. Topics in Public Affairs.** (3:3:0 ea.)  
Buckwalter, Slover, Williams

**350R. Political Systems of the USSR and Eastern Europe.** (3:3:0 ea.) Recommended: Pol. Sci. 150 or Hist. 330 or 331. Mabey, Morrell

**351R. Parliamentary Government and Politics.** (3:3:0 ea.)  
Grow, Mabey, Farnsworth, Morrell

**352R. Third World Government and Politics.** (3:3:0 ea.)  
Farnsworth, Tullis

**359R. Topics in Comparative Government and Politics.** (3:3:0 ea.)  
Farnsworth, Mabey, Morrell, Tullis

**360. Constitutional Law—American Federal System.** (3:3:0)  
Reeder, Williams

**361. Constitutional Law — Rights and Immunities.** (3:3:0)  
Reeder, Williams

**363. Administrative Law of the U.S.** (3:3:0) Reeder

**364. Jurisprudence.** (3:3:0) Midgley, Reeder

**368. Anglo-American Legal Institutions.** (3:3:0)

**370. Theory of International Relations.** (3:3:0) Prerequisite: Pol. Sci. 170. Recommended: Pol. Sci. 300. Hillam

**373. International Law.** (5:5:0) Reeder

**375. International Organizations.** (3:3:0) Prerequisite: Pol. Sci. 170. Recommended: Pol. Sci. 300. Taylor

**377R. Foreign Relations.** (3:3:0 ea.) Buckwalter, Hickman, Morrell, Taylor

**378R. International Systems.** (3:3:0 ea.) Hickman, Hillam, Morrell, Taylor, Tullis

**379R. Topics in International Relations.** (3:3:0 ea.)  
Hickman, Hillam, Slover, Taylor

**500R. Field Study.** (1-9:Arr.:Arr. ea) Prerequisites: Pol. Sci. 110 or 310, 300.

Study and field experience through observation and participation in the process of government.

**501R. Advanced Topics.** (3:3:0 ea.)

Select advanced topics for graduate students only. Can be taken concurrently with 300- and 400-level courses.

**505. Asian Political Thought.** (3:3:0) Jagchid  
Survey of Asian political thought both traditional and modern.

**512. Public Policy.** (3:3:0) Recommended: Pol. Sci. 310 and 312.

A treatment of contemporary public problem identification; the processes of policy formulation and legitimization; and evaluation of public policies.

☐ **Public Administration 600. Fundamentals of Public Administration.** (3:3:0)

☐ **Public Administration 602. Organizational Analysis.** (3:3:0)

☐ **Public Administration 603. Public Personnel Administration.** (3:3:0)

☐ **Public Administration 604. Public Finance Administration.** (3:3:0)

☐ **Public Administration 608. Contemporary Issues and Administration.** (3:3:0)

☐ **Public Administration 620. Municipal Administration.** (3:3:0)

☐ **Public Administration 621. City Planning.** (3:3:0)

☐ **Public Administration 630. International Project Administration.** (3:3:0)

☐ **Public Administration 631. Comparative Public Administration.** (3:3:0)

☐ **Public Administration 640R. Program Administration.** (3:3:0 ea.)

**645R. Graduate Colloquium.** (½:1:0 ea.) Staff  
Established for occasional papers and departmental needs.

**690R. Seminar in Political Philosophy.** (1-3:1-3:0 ea.)  
Prerequisite: related advanced course(s). Melville, Midgley, Sorensen

**691R. Seminar in Politics.** (1-3:1-3:0 ea.) Prerequisite: related advanced course(s). Buckwalter, Grow, Melville, Slover

**692R. Seminar in Empirical Theory.** (3:3:0 ea.) Prerequisite: related advanced courses. Buckwalter, Taylor

**695R. Seminar in Comparative Government and Politics.** (1-3:1-3:0 ea.) Prerequisite: related advanced course(s). Farnsworth, Mabey, Morrell, Tullis

**696R. Seminar in Public Law.** (1-3:1-3:0 ea.) Prerequisite: related advanced course(s). Reeder, Williams

**697R. Seminar in International Relations.** (1-3:1-3:0 ea.) Prerequisite: related advanced course(s). Hickman, Hillam, Taylor

**698R. Directed Individual Study.** (1-2:1-2:0 ea.) Prerequisite: permission of graduate committee and instructor.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)

## Psychology

**Professors.** Allen, Bennion, Bergin, Cooper, Cundick, Daniels, Fleming (graduate coordinator, 1230-B SFLC), Hardy, Howell, Jensen, Pedersen (chairman, 1230-A SFLC), B. Robinson, Smith.

**Associate Professors.** Brown, Bunker, Higbee, Payne, Stimpson, Thorne.

**Assistant Professors.** Jenkins, Lambert, Maughan, P. Robinson, Sorenson, Weight, Wells.

## Programs

School Psychology: Master of Science (M.S.).

General Psychology: Doctor of Philosophy (Ph.D.).  
Clinical Psychology: Doctor of Philosophy (Ph.D.).  
Instructional Psychology: Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** None.

**Application Consideration Dates.** January 15 (and June 15 to fill the remaining available positions, if any).

**Entry Times.** Fall Semester (exceptional cases may be considered for Winter Semester and Spring and Summer terms).

## Master of Science: School Psychology

(Interdisciplinary program jointly offered by the departments of Psychology and Educational Psychology)

**Prerequisites.** Background work in psychology, including elementary psychological statistics. Those who have not had courses in child psychology, learning, personality, and exceptional children will be required to take such courses as part of their program.

**Minors Permissible.** Option II only.

**Requirements.** Minimum of 42 semester hours plus thesis (6-hr. min.—699). Sixty semester hours are required for certification in many states and 60 semester hours are recommended.

**Required Courses.** Psych. 640, 641, 670, 680; Ed. 647, 665R, 667, 680R, 690R, 696R, 470 or CDFR 430. Students majoring in the Psychology Department are also required to take Psych. 670, 690, and 699. Students majoring in the Educational Psychology Department are also required to take Stat. 552, Ed. 660 and 699. Additional elective courses required as part of the program are to be selected with approval of the student's committee. Psych. 640, 680 should be taken first Fall Semester in residence. Psych. 641 should be taken first Winter Semester in residence. All required courses except Psych. 690, 699, or Ed. 660, 699 must be taken before Ed. 680R.

**Note:** Most states require the certification of practicing school psychologists. Early in the student's program he should consult the certification requirements for the state or states in which he may wish to work. These requirements vary widely. The above courses offer a solid core of training; however, most states have special requirements that should be taken into account when planning the graduate program. A file of many states' requirements is maintained at the Psychology Clinic, 257 EDLC.

**Professional Preparation.** Preparation for work in school districts as a school psychologist.

## Doctor of Philosophy: General Psychology

**Prerequisites.** Bachelor's degree, including courses in general psychology, elementary psychological statistics, experimental psychology, and three courses chosen from sensation and perception, motivation, personality, and principles of learning or their equivalent. Tool requirement I, II, III, or IV is acceptable. If tool requirement III is used, the tool subject will be computer science (Comput. Sci. 130 or 131 and Psych. 570) and any additional three hours from Computer Science, Statistics, or Mathematics 112 or beyond. If tool requirement IV is used, the tool subject will be computer science (Math. 112; Comput. Sci. 131 or 231, 571; Psych. 570 and 672 or 673; and one class from Stat. 433, 531, 534, or 536).

**Fields.** Experimental psychology, social psychology.

**Minors Permissible.** Any approved minor or Option II.

**Requirements.** Minimum of 54 semester hours plus dissertation (18-hr. min.—799). Completion of courses with a minimum grade of B- in each course and an overall GPA of 3.2 in all courses.



**Required Courses.** Psych. 520, 530, 550, 560, 565, 585, 610, 670, 671, 690, and other courses as specified by the advisory committee.

**Professional Preparation.** University and college positions, organizational consultation, and research.

### Doctor of Philosophy: Instructional Psychology

(Interdisciplinary program jointly offered by the departments of Psychology and Educational Psychology)

For information concerning this developing program, please communicate directly with the Department of Psychology or the Department of Educational Psychology.

### Doctor of Philosophy: Clinical Psychology

**Prerequisites.** Bachelor's degree, including courses in general psychology, elementary psychological statistics, experimental psychology, personality, learning, abnormal psychology, and sensation and perception or motivation (equivalent course content is acceptable). Tool requirement I, III, or IV is acceptable. If tool requirement I is desired, petition must be filed stating the usefulness of this language in the specific clinical work that is anticipated. If tool requirement III is used, the tool subject will be computer science (Comput. Sci. 130 or 131 and Psych. 570). If tool requirement IV is used, the tool subject will be computer science (Math. 112; Comput. Sci. 131 or 231, 571; Psych. 570 and 672 or 673; and one class from Stat. 433, 531, 534, or 536).

**Minors Permissible.** Option II only.

**Requirements.** Minimum of 71 semester hours plus dissertation (18-hr. min.—799). Completion of courses with a minimum grade of B- in each course and an overall GPA of 3.2 in all courses. Satisfactory completion of specialty examinations during the third year of program. One year's internship. (Comprehensive examinations must be completed prior to internship.) Completion of all requirements, including dissertation, for the doctoral degree must be accomplished within two calendar years after internship. It is recommended that in most instances the dissertation be completed before internship.

**Required Courses.** The following core courses: Psych. 520, 530, 560, 565, 585, 610, 670, 671, and 690; plus 15 hours of committee-approved electives. Completion of the following courses in the sequence as listed:

Fall Semester, first year—Psych. 640, 645, 670, 784R, and one graduate core course as outlined above.

Winter Semester, first year—Psych. 641, 671, 680, 784R, and one graduate core course as outlined above.

Fall Semester, second year—Psych. 642, 681, 690, and one other graduate core course as outlined above.

Winter Semester, second year—Psych. 675, 682, and two graduate core courses as outlined above.

Fall Semester, third year—Psych. 690, 740R, elective courses for tool requirement II.

Winter Semester, third year—Psych. 740R; elective courses for tool requirement II.

**Professional Preparation.** College and university positions, mental health centers, hospitals, and mental health program evaluation.

**Graduate Minor in Psychology.** The student must have 12 semester hours of psychology courses as undergraduate preparation. In addition to these he must have nine semester hours that will be counted as graduate credit.

### Courses

**511. Instructional and Communicative Techniques.** (2:1:2) Prerequisite: graduate standing in psychology.

Under faculty supervision, the student is given experience in planning, conducting, and carrying out the instruction of an undergraduate course.

**520. Advanced Developmental Psychology.** (3:3:0)

An overview of major research in genetic psychology, with emphasis placed on theory, content, and methodology.

**526. Mental Retardation.** (2:2:0) Prerequisite: Psych. 378 or equivalent.

**530. (Sociol.—Psych.) Theory and Research in Social Psychology.** (3:3:0) Prerequisite: Sociol.-Psych. 350.

A survey of current theory and research in social psychology, with emphasis on understanding the individual interaction.

**550. Personality Theory.** (3:3:0) Prerequisites: Psych. 111, 450, and five additional hours in psychology.

A critical review of the contemporary theories of personality that have been developed within the framework of major psychological systems.

**554. Psychology of Religion.** (2:2:0) Prerequisite: Psych. 111.

Classification of religious behavior and experience; source of religious motivation; religion and the growth process.

**555. (Sociol.-Psych.) Group Dynamics.** (3:3:0) Prerequisite: Sociol.-Psych. 350.

Research and theories in group dynamics. May be used for credit either in psychology or sociology, but not in both.

**560. Learning Theory.** (3:3:0) Prerequisites: Psych. 111, 460, and five additional hours in psychology.

A critical review of current theories of learning and persistent problems.

**561. Psycholinguistics.** (3:3:0) Prerequisite: Psych. 111.

A survey of research and theory in verbal learning and verbal behavior, and the social implications of language usage.

**562. Cognitive Processes.** (3:3:0) Prerequisites: Psych. 360, or equivalent; graduate standing or consent of instructor.

A study of major theoretical and empirical developments. Interaction of sensory, perceptual, learning, and thinking processes.

**565. Motivational Psychology.** (3:3:0) Prerequisites: Psych. 365 or equivalent; graduate standing or consent of instructor.

Theoretical, historical, and empirical overview; recent trends and issues. Role of animal studies; methodological problems.

**570. Computer Use in Behavioral Sciences.** (3:3:6) Prerequisites: Psych. 370; Comput. Sci. 231; or equivalent.

The use of electronic digital computers in the behavioral sciences.

**574. Advanced Experimental Psychology.** (2:1:5) Prerequisites: Psych. 111, 374, or equivalent.

Principles of instrumentation and experimental designs. Experience in planning, conducting and reporting experiments.

**577. Laboratory Instrumentation and Techniques.** (3:1:4) Prerequisite: Psych. 374.

**583. Behavior Modification Techniques.** (3:2:2)

Practical applications of behavior modification to academic, discipline, and emotional target behaviors of individuals and groups.

**585. Psychophysiology.** (3:3:0) Prerequisite: Psych. 111.

Critical study of physiological processes and psychological functions, including sensation, emotion, sleep and activity, motivation, and learning.

**587. Psychopharmacology.** (3:3:0) Prerequisite: Psych. 585 or equivalent.

A study of the major classes of psychoactive drugs, with emphasis on drug-behavioral interactions.

**589. Psychobiology.** (3:3:0) Prerequisite: Psych. 111. Fleming  
Similarities and differences in the behavior of organisms.

**597R. Independent Research.** (1-3:0:2-6 ea.)

**610. History and Systems of Psychology.** (3:3:0)  
A survey of the origins and development of modern psychology, including consideration of the schools and theoretical systems.

**630. (Sociol.-Psych.) Attitude Change.** (3:3:0) Prerequisite: consent of instructor.

Study of attitude development, change, and assessment, including a focus on both individual and mass persuasion.

**640. Psychodiagnostics 1: Intelligence Testing.** (3:3:5) Prerequisite: acceptance in clinical psychology.

**641. Psychodiagnostics 2: Child and Adolescent.** (3:2:6) Prerequisite: acceptance in clinical or school psychology program.

**642. Psychodiagnostics 3: Adult.** (3:2:3) Prerequisite: acceptance in clinical psychology.

**644. Rorschach Techniques.** (3:2:5) Prerequisite: acceptance in clinical psychology.

**645. Issues in Clinical Psychology.** (3:3:0) Prerequisite: acceptance in clinical psychology.

**646. Community Mental Health.** (3:2:2) Prerequisite: acceptance in clinical psychology.

Program evaluation, epidemiology of crime, alcoholism, suicide, psychoses, and mental retardation. Offered alternate years.

**651. Psychopathology.** (3:3:2) Prerequisite: nine hours in psychology.

**665. Human Motivation.** (3:3:0) Prerequisites: Psych. 365 or equivalent; graduate standing in psychology or allied discipline.

**670. Advanced Statistics 1.** (3:3:2) Prerequisite: Psych. 370.

**671. Advanced Statistics 2.** (3:3:2) Prerequisite: Psych. 670.

**672. Psychological Scaling.** (3:3:0) Prerequisite: Psych. 670.

Scaling theory and methodology, with emphasis upon measurement in psychophysics and differential psychology. Offered alternate years.

☐Org. Behav. **672. The Consultative Process.** (3:3:0)

**673. Multivariate Analysis in Psychology.** (3:3:0) Prerequisite: Psych. 670.

The principal descriptive statistics used in the analysis of multiple measurements: factor analysis, canonical correlation, multivariate analysis of variance and covariance, and multiple discriminant analysis. Offered alternate years.

**675. Personality Dynamics.** (3:3:0) Prerequisites: undergraduate core courses and consent of instructor.

☐Org. Behav. **675. Theory and Method of Laboratory Training.** (3:2:2)

**678. Measurement Theory.** (3:3:0)

**680. Psychotherapy 1: Child and Family.** (3:3:3) Prerequisite: acceptance in clinical psychology.

**681. Psychotherapy 2: Adult.** (3:3:0) Prerequisite: acceptance in clinical psychology.

**682. Psychotherapy 3: Group.** (3:1:6) Prerequisite: acceptance in clinical psychology.

**683. Behavior Modification Therapy.** (3:2:1) Prerequisite: acceptance in clinical psychology.

**690. Seminar: Research Problems.** (2:2:0)

**695R. Independent Readings.** (1-2:Arr.:Arr. ea.)

**699. Master's Thesis.** (6-9:Arr.:Arr.)

**740R. Clinical Practicum.** (3:0:8 ea.) Prerequisite: acceptance in clinical psychology.

**741R. Practicum in Assessment.** (3:0:8 ea.) Prerequisite: acceptance in clinical psychology.

**742R. Projects in Clinical Psychology.** (3:0:8 ea.) Prerequisite: acceptance in clinical psychology.

**749R. Clinics Practicum.** (1-2:0:3-6 ea.) Prerequisite: acceptance in clinical psychology.

Supervised practical experience in individual and group testing and therapy, in various clinical settings.

**750, 751, 752, 753. Clinical Internship.** (2:0:40 ea.) Prerequisite: acceptance in clinical psychology.

**784R. Interpersonal Skills.** (0:0:3 ea.) Prerequisite: acceptance in clinical psychology.

**790R. Seminar: Developmental.** (2:2:0 ea.) Prerequisite: consent of instructor.

**792R. Seminar: Social Psychology.** (2:2:0 ea.) Prerequisites: consent of instructor; Sociol.-Psych. 350.

**795R. Seminar: Experimental Psychology.** (2:2:0 ea.) Prerequisite: consent of instructor.

**796R. Seminar: Clinical Psychology.** (2:2:4 ea.) Prerequisite: acceptance in clinical psychology.

**797R. Independent Research.** (1-4:0:3-12 ea.) Prerequisite: consent of instructor.

**799. Ph.D. Dissertation.** (Arr.)

## Recreation Education

**Professors.** Call, Hafen (chairman, 273-C RB), Hartvigsen, Jensen, Shaw (college coordinator, 221-F RB).

**Associate Professors.** DeHoyos, Heaton, Naylor, Olsen, Packer, Thorstenson.

**Assistant Professor.** Hansen.

**Programs.** Master of Arts (M.A.), Master of Recreation Education (M.R.Ed.).

**Entrance Examination Required.** Cooperative English Test 2A, "Effectiveness of Expression."

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

## Master of Arts

**Prerequisites.** Undergraduate major or minor in recreation. Upon special permission, students may be admitted with other undergraduate work but must complete selected prerequisite classes.

**Fields.** Community school leadership, municipal recreation administration, outdoor recreation, therapeutic recreation.

**Minors Permissible.** Options I and II.

**Requirements.** Minimum of 26 semester hours plus thesis (6-hr. min.).

**Required Courses.** Community school option: Rec. Ed. 585, 605, 679R, 692 or Ed. 600, 696R, and Ed. 675 or



Rec. Ed. 505. All other options: Rec. Ed. 609, 692, 694 and Statistics 552.

## Master of Recreation Education

**Prerequisites.** Undergraduate major or minor in recreation. Upon special permission, students may be admitted with other undergraduate work but must complete selected prerequisite classes.

**Fields.** Community school leadership, municipal recreation administration, outdoor recreation, therapeutic recreation.

**Minors Permissible.** Options I and II.

**Requirements.** Minimum of 32 semester hours, including field project (2-hr. min.).

**Required Courses.** Community school option: Rec. Ed. 585, 605, 679R, 692 or Ed. 600, 696R, and Ed. 675 or Rec. Ed. 505. All other options: Rec. Ed. 585, 609, 692, and 694.

## Courses

**502R. Camping Workshop.** (2:2:4 ea.) Fee required.  
Hansen, Packer

Features training and preparation for a week of laboratory experience in a primitive area. A maximum of 4 credit hours permitted.

**503. Administration of School and Community Camps.** (2:2:Arr.) Hansen

Administration of camps and outdoor programs, site selection and development, and program planning and staffing.

**505. Administration of Community Recreation.** (3:3:0) Prerequisites: Rec. Ed. 301, 337. Naylor

Facilities, personnel, financing, budget, legal aspects, and departmental organization as they relate to community recreation.

**570. Therapeutic Recreation for Neurological Handicaps.** (2:1:2) Prerequisites: Rec. Ed. 370, 470, or equivalent. Call

Recreation programs in school, community, and hospital settings, for individuals with neurological and other handicaps.

**583. Workshop in Recreational Dance.** (1-2:0:40-80) Heaton

Advanced techniques for teaching dance to recreation groups.

**585. The Community School.** (2:2:1) Olsen

Basic concepts of the community school, including its history, organization, funding, leadership, facilities, and value to the community.

**605. Community School Administration.** (2:1:Arr.) Olsen

Analysis of administrative problems related to leadership, organization, finance, legal aspects, and public relations.

**609. The Recreation Program.** (2:1:Arr.) Naylor, Thorstenson

A practicum in the analysis and design of community and agency recreation programs.

**679R. Internship in Community School Leadership.** (1-6:1-6:3-30 ea.) Olsen

Students are assigned to work with experienced directors, with whom they may gain practical experience. A maximum of 12 credit hours permitted.

**692. Research Methods in Recreation.** (3:3:0) DeHoyos, Shaw

Preparation of the research proposal, and guidelines to writing the thesis.

**694. Seminar in Readings.** (2:2:0) Hafen  
Readings from professional literature. Includes group discussion of pertinent materials.

**696R. Seminar in Problems.** (1-2:1-2:0 ea.) Olsen  
A maximum of 4 credit hours permitted.

**698. Field Projects.** (1-4:Arr.:Arr.) Hafen

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Hafen

## Religious Instruction

### Ancient Scripture

**Professors.** R. L. Anderson, Nibley, Patch (chairman, 122 JSB), Rasmussen, Sperry (emeritus).

**Associate Professors.** Cheesman, Nyman, H. D. Peterson, Ricks.

**Assistant Professors.** Harris, Matthews.

**Entry Times.** Any regular registration.

### Minors in the Department of Ancient Scripture

**Prerequisites.** There is no undergraduate major in scriptural studies at BYU. It is recommended that undergraduates get a strong background through course work and study in the scriptures.

**Minors Permissible.** Option I or II.

**Requirements.** A minimum of 9 semester hours of approved course work, 5 of which must be taken in residence.

This program is designed primarily to serve the needs of the LDS seminary and institute teachers.

Some students may be interested in applying course work from this department toward either the master's or the doctor's degree in the new interdepartmental Institute of Ancient Studies. Information about it may be requested from the dean of the Graduate School, from the chairman of the Department of Ancient Scripture, or from the chairmen of other participating departments.

## Courses

**501. Analysis of the Old Testament: The Pentateuch and Historical Books.** (3:3:0)

**502. Analysis of the Old Testament: Prophetic Books.** (2:2:0)

**503. Analysis of the Old Testament: Poetic and Wisdom Literature.** (2:2:0)

**511. The Gospels.** (2:2:0)

**512. Paul's Life and Letters.** (2:2:0)

**513. The General Epistles and the Apocalypse.** (2:2:0)

**514. New Testament Times.** (2:2:0)

**521. Analysis of the Book of Mormon 1.** (3:3:0)

**522. Analysis of the Book of Mormon 2.** (3:3:0)

**523. External Evidences of the Book of Mormon.** (2:2:0)

**527. History and Doctrines of the Pearl of Great Price.** (3:3:0)

**604. Origins of the Old Testament.** (3:3:0)

**606. The Apocrypha and Pseudepigrapha.** (2:2:0)

**608R. Readings in Old Testament Studies.** (1-6:1-2:0 ea.)

**609R. Seminar: Old Testament.** (1-6:1-2:0 ea.)

**610. Early Christian Literature.** (2:2:0)

611. Formation of the New Testament: Text and Canon. (2:2:0)
612. Textual Criticism of the New Testament. (2:2:0)
- 618R. Readings in the New Testament. (1-6:1-2:0 ea.)
- 619R. Seminar: New Testament. (1-6:1-2:0 ea.)
- 621R. Seminar: Book of Mormon. (1-6:1-2:0 ea.)
- 627R. Seminar: Pearl of Great Price. (1-6:1-2:0 ea.)
699. Thesis for Master's Degree. (6-9:Arr.:Arr.)
799. Ph.D. Dissertation. (Arr.)

## Church History and Doctrine

**Professors.** Andrus, Backman, Barron, L. Berrett (chairman, 123 JSB), Burton, Cowan, Doxey (emeritus), Horsley, Palmer, Rich, Turner.

**Associate Professors.** G. Anderson, Bowen, Cannon, Fugal, Garrard, Hartshorn, M. Petersen.

**Assistant Professor.** Porter.

## Minors in Church History and Doctrine

**Prerequisites.** Relig. 341, 342, or a knowledge of the contents of *The Comprehensive History of the Church*, by B. H. Roberts.

**Fields.** Christian history, Doctrine and Covenants, LDS history, theology, world religions.

**Requirements.** A minimum of 9 semester hours of approved course work. Five of the 9 hours must be completed on the BYU campus.

## Courses

524. Analysis of the Doctrine and Covenants 1. (3:3:0)
525. Analysis of the Doctrine and Covenants 2. (3:3:0)
530. LDS Theology. (2:2:0)
535. Mormonism and Modern Scientific Thought. (2:1:2)  
A consideration of problems arising between science and religion.
540. Historiography and the Writing of LDS History. (3:3:0)
541. Documents of LDS Church History (1820-1839). (3:3:0)
542. Documents of LDS Church History (1839-1850). (3:3:0)
543. Documents of LDS Church History (1850-1900). (3:3:0)
544. Documents of LDS Church History (1900 to Present). (3:3:0)
546. Social, Economic, and Political Thought of Joseph Smith. (2:2:0)
547. Historical Setting of Mormonism. (3:3:0)
551. History of the Early Church through the Fourth Century. (3:3:0)
552. Medieval and Reformation Christianity. (3:3:0)
553. History of the Christian Church since the Seventeenth Century. (3:3:0)
555. Comparative World Religions. (2:2:0)
556. Comparative World Religions. (2:2:0)
557. Religions of the Ancient Near East. (2:2:0)

559. The Church in Asia. (2:2:0)
570. Survey of Religious Education. (2:2:0)
571. Methods of Teaching Religion in Secondary Schools. (2:5:0)
572. Methods of Teaching Religion in Secondary Schools. (2:5:0)
- 579A,B,C,D,E. Seminar: Gospel Principles in the Scriptures and Church History. (2:5:0 ea.)  
A—Old Testament; B—New Testament; C—Book of Mormon; D—Doctrine and Covenants; E—Church History.
- 595R. Graduate Seminar. (1-2:2:0 ea.)  
Discussions on religious topics of current interest, primarily for graduate students not majoring in religion.
- 596R. Graduate Seminar. (1-2:2:0 ea.)  
Discussions on religious topics of current interest, primarily for graduate students not majoring in religion.
- 624R. Seminar: Doctrine and Covenants. (1-6:1-2:0 ea.)
- 628R. Readings in Modern Scripture. (1-6:1-2:0 ea.)
- 638R. Readings in Christian Theology. (1-2:Arr.:0 ea.)
643. Schismatic Movements in Mormon History. (2:2:0)
647. LDS Church History by Travel Study. (2:Arr.:Arr.)
- 648R. Readings in LDS Church History. (1-6:1-2:0 ea.)
- 649R. Seminar: History of Religion. (1-6:1-2:0 ea.)
657. Comparative Studies in American Religions. (3:3:0)
- 658R. Readings in Christian History. (1-6:1-2:0 ea.)
- 659R. (Hist.-Relig.) Seminar in History of Asian Religions. (1-6:1-2:0 ea.)
- 668R. Readings in the History of World Religions. (1-6:1-2:0 ea.)
671. Curriculum of Religion in Secondary Schools. (2:5:0)
672. Religious Curriculum Building for Secondary Schools. (2:5:0) Prerequisite: Relig. 671.
673. Methods of Teaching Religion in College. (2:5:0)
674. Methods of Teaching Religion in College. (2:5:0)
675. Curriculum of Religion in College. (2:5:0)
676. Religious Curriculum Building for Colleges. (2:5:0)  
Prerequisite: Relig. 675.
677. Problems of Teaching Religion. (1:3:0)
699. Thesis for Master's Degree. (6-9:Arr.:Arr.)
799. Ph.D. Dissertation. (Arr.)

## Sociology

**Professors.** Bahr (graduate coordinator, 172 FOB), Bradford, Brower, Christiansen, Duke, Larsen, Peterson (chairman, 184 FOB), Smith, Staley, Warner.

**Associate Professors.** Albrecht, Blake, Chadwick, Condie, Craig, Kunz, Seggar, Spencer.

**Assistant Professors.** G. DeHoyos, England.

**Programs.** Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** The Graduate Record Examination, including the aptitude test and the advanced test in sociology.

**Application Consideration Dates.** April 15 for Fall



Semester, October 15 for Winter Semester, February 15 for Spring Term, and March 15 for Summer Term.

**Entry Time.** Any regular registration.

## Master of Science

**Prerequisites.** Minimum of 15 semester hours (or equivalent) in sociology, including courses in introductory sociology, statistics, methods of research in sociology, development of sociological theory, and contemporary sociological theory.

**Field.** General sociology, with an emphasis on either social organization or social psychology.

**Minors Permissible.** Option I or II. However, all candidates for the M.S. must complete 20 hours of required classes, including 14 hours in tool areas and the 6-hour graduate survey course in either social organization or social psychology.

**Requirements.** (1) Completion of 30 hours of graduate work, including 24 hours in regular course work and 6 hours on thesis project; (2) Demonstration of competence in the following tool areas, both by completion of required course work and examination: sociological theory, research methods, and statistics; (3) Demonstration of competence, by adequate performance in a comprehensive written examination, in the substantive areas of either social organization (including social stratification, social change, complex organizations, community, and social institutions) or social psychology (including attitude and behavior, major social psychological theories, social influence, dynamics of attitude change, personality and culture, small groups, communication, leadership, and social exchange); (4) Completion and oral defense of an acceptable thesis.

**Required Courses.** Sociol. 597R (2 hrs.), 600, 606, 610, 611, and 620R (6 hrs.).

## Doctor of Philosophy

**Prerequisite.** A master's degree in sociology or the equivalent.

**Fields.** Family sociology, social organization, social psychology.

**Minors Permissible.** An approved minor field.

**Requirements.** (1) Completion of 60 semester hours of acceptable graduate work, including at least 48 semester hours of graduate work in sociology completed in graduate status, exclusive of the doctoral dissertation and the master's thesis; (2) Demonstration of competence at the doctoral level in the following tool areas, both by completion of required course work and examination: sociological theory, research methods, and statistics; (3) Demonstration of competence, by adequate performance in a comprehensive written examination, in two of the following special areas: social organization, social psychology, deviant behavior, race and ethnic relations, family sociology, demography and human ecology; (4) Preparation and oral defense of a dissertation project prospectus; (5) Completion and oral defense of an acceptable dissertation.

**Required Courses.** All courses required for the Master of Science degree in sociology or their equivalent, and Sociol. 700, 706, and 711, plus at least 9 hours of graduate coursework in each of the two special areas selected for comprehensive examinations.

## Graduate Minor in Sociology

A student working toward a master's degree in another department may complete a minor in sociology by satisfactorily completing Sociol. 610 plus graduate semester hours in areas related to his major specialization, as approved by his advisory committee.

A student working toward a doctoral degree in another department with a minor in sociology must, in collaboration with the member of his committee from the sociology faculty, outline a program in accordance with the needs of the student. The student selects a specialty area from the fields listed above and must take the same comprehensive examination given to students from the Department of Sociology who have selected that area.

## Courses

**504. Mathematical Sociology.** (3:3:0) Prerequisite: Math. 105. England

Mathematical techniques of simulating and modeling social processes.

**522. Social Stratification.** (3:3:0) Prerequisite: Sociol. 111. DeHoyos, Duke  
Status, class, and power systems in various societies.

**525. Sociology of Religion.** (2:2:0) Seggar, Staley  
Influences of social factors in the development of various religious systems.

**526. Sociology of Education.** (2:2:0) Craig, Smith  
Social origins of goals and curricula; theories of change and control; and the nature of achievement in education.

**540. The Family Institution.** (3:3:0) Bradford, Christiansen  
The family in several different societies, and problems created by various family systems.

**545. Demographic Analysis.** (3:3:0) Prerequisite: Sociol. 245. Bahr, Kunz  
Formerly Sociol. 623.

**552. Personality: Culture and Society.** (3:3:0) Prerequisite: Sociol. 111 or Psych. 111. DeHoyos, Staley  
The role of culture and society in the forming and functioning of personality. Compares various peoples and cultures.

**555. (Sociol.-Psych.) Group Dynamics.** (3:3:0) Prerequisite: Sociol.-Psych. 350. England

**590R. Special Topics in Sociology.** (1-3:1-3:0 ea.) Prerequisite: consent of instructor.

**595R. Directed Readings.** (1-3:0:2-6 ea.)

**597R. Special Research Problems.** (1-3:0:2-6 ea.)

**600. Advanced Research Methods.** (3:3:0) Prerequisite: Sociol. 300 or consent of instructor. Bahr  
Chadwick, Johnson  
Investigation of sociological data; field projects.

**601. Seminar in Survey Research.** (3:3:0) Prerequisite: Sociol. 300 or equivalent; graduate standing in sociology or allied discipline. Chadwick, Christiansen, Johnson  
Survey research as a specific research technique of the behavioral sciences, with emphasis on research and sampling designs.

**606. Intermediate Statistics.** (3:3:0) Prerequisite: Sociol. 206. England  
Hypothesis testing and decision making for sociologists.

**610. Seminar in Contemporary Sociological Theory.** (3:3:0) Prerequisites: Sociol. 411 and 412. DeHoyos, Duke

Recent developments in theory, including structural-functionalism, conflict theory, general systems theory, exchange theory, and symbolic interactionism.

**611. Seminar in Sociological Theory Building.** (2:2:0) Prerequisite: Sociol. 610. Condie, Peterson

**612. Seminar in the Development of Sociological Theory.** (2:2:0) Prerequisite: Sociol. 610. Duke  
Contributions of sociological theorists, including Durkheim, Weber, Pareto, and Simmel, to sociological theory development.

**620R. Theory and Research in Social Organization.** (3:3:0 ea.) Kunz, Warner

Graduate survey of the field of social organization and of the core subfields therein, including: social stratification, social movements and change, complex organizations, community, and institutions.

**623. Seminar in Race and Ethnic Relations.** (3:3:0) Chadwick**630. (Sociol.-Psych.) Attitude Change.** (3:3:0) Prerequisite: graduate standing or consent of instructor.

Albrecht, Blake, Larsen  
Theoretical approaches to the study of attitude development, change, and assessment, including a focus on both individual and mass persuasion.

**640. Familial Role Structure.** (3:3:0) Prerequisite: Sociol. 340. Bradford, Kunz

Characteristics and problems of roles in the family in various societies, with emphasis on the United States.

**670. Contemporary Urban Social Structure.** (3:3:0) Prerequisite: Sociol. 370. Staley

Research-oriented examination of social forces in contemporary urban life which influence patterns of human interaction.

**681. Seminar in Deviance and Deviant Behavior Systems.** (3:3:0) Prerequisites: Sociol. III and 381. Smith

Research and theory concerning criminal typologies. A diagnostic course to complement Sociol. 582.

**682. Seminar in Criminology and Corrections.** (3:3:0) Prerequisites: Sociol. III or II2 and 381. Smith

Contemporary police, judicial, and treatment programs for criminals. Pre-sentence procedures, probation, parole, classification, and modern rehabilitation programs in and out of prison are studied sociologically.

**697R. Directed Research.** (1-3:0:2-6 ea.)**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)**700. Sociological Measurement.** (3:3:0) Prerequisites: Sociol. 600, 606, 706. England, Johnson

Unidimensional and multidimensional measurement techniques, with emphasis on theoretical, methodological, and substantive consequences of technique selection.

**706. Advanced Statistical Methods.** (3:3:0) Prerequisite: Sociol. 606. England

Factor analysis, multivariate analysis, and covariate analysis.

**711. Sociological Theory and Theory Building.** (3:3:0) Prerequisites: Sociol. 600, 606, 610, and 8 hours additional sociological theory. Condie, Duke

Exploration of latest contributions to theory and current endeavors in the construction of sociological theories.

**720R. Seminar: Social Organization.** (1-3:1-3:0 ea.) Prerequisites: Sociol. III and 320. Albrecht, Kunz, Warner**750. Seminar: Social Psychology.** (2:2:0) Prerequisites: Sociol. 350 and consent of instructor. Blake, Chadwick, Larsen**799. Dissertation for Ph.D.** (Arr.)**Speech and Dramatic Arts**

**Professors.** Bateman, Gledhill, Hansen, Metten (chairman, D-581 HFAC), Woodbury.

**Associate Professors.** Gibb, Henson, Oaks, Pope, Richardson, Stephan, Whitman.

**Assistant Professors.** Frost, Jenkins, Peterson.

**Programs**

Dramatic Arts: Master of Arts (M.A.), Doctor of Philosophy (Ph.D.).

Speech Communication: Master of Arts (M.A.).

**Application Consideration Dates.** Same as Graduate School deadlines.

**Entry Times.** Any regular registration.

**Dramatic Arts: Master of Arts**

**Prerequisites.** Acceptable undergraduate background in dramatic arts.

**Fields.** Theater history, acting, directing, interpretation, technical theater, playwriting, child drama, theater administration.

**Minors Permissible.** Option I or II.

**Requirements.** 26 hours plus thesis (6-hr. min.—699); or 32 hours plus a written report of project (to be filed with graduate school) and a comprehensive written and oral examination.

**Required Course.** Sp. and Dram. Arts 690, required of all graduate students during first semester of registration.

**Dramatic Arts: Doctor of Philosophy**

**Field.** Dramatic arts.

**Requirements.** 45 hours in drama, 15 hours in a minor, plus a dissertation (18-hr. min.—799). Three kinds of dissertation research will be accepted: (1) scholarly analysis of history, theory, and criticism; (2) research and strong creative achievement in playwriting and theatrical production; and (3) measurement studies.

**Required Courses.** Sp. and Dram. Arts 690 and 799.

**Speech Communication: Master of Arts**

**Prerequisites.** 1. Candidate must have received B.A. or B.S. from an accredited institution with a 3.0 GPA or over in his last 60 semester hours of course work. 2. If candidates do not have an adequate background in Speech Communication certain undergraduate courses will need to be completed before the Master's degree program is undertaken. Fulfillment of this requirement will be decided upon in each individual case by the candidate's advisory committee. Candidate must take the Miller Analogies Test which may be taken at the BYU Testing Service. 3. Candidate must meet all Brigham Young University Graduate School Requirements.

**Entrance Examination Required.** Miller Analogies Test.

**Fields.** Dramatic arts, speech.

**Minors Permissible.** Option I or II.

**Requirements.** Thesis option: 24 semester hours plus thesis. Non-thesis option: 40 semester hours plus written exam and major paper.

**Required Courses.** Sp. and Dram. Arts 600 and 690.

**Courses****522R. Acting 5.** (5:5:6 ea.) Prerequisite: Sp. and Dram. Arts 324R. Whitman, Crosland, Hansen

Theory and practice of major historical and modern styles of acting and actor preparation.

**524R. Acting 6.** (5:1:2 ea.) Prerequisites: Sp. and Dram. Arts 522R or equivalent, and acting competency shown in audition. Hansen, Whitman

Supervised applied acting experience in full-length play produced for an audience.

**527. Narration.** (2:2:0) Clinger, Frost

The utilization of principles, practice, materials, and visual aids to create imagery in storytelling. Valuable to teachers and youth leaders.



**560R. Theater Workshop.** (1-6:0:3-18 ea.)

Integration in production of theater's individual arts: literature, directing, acting, and stagecraft.

**564. Theater History 1.** (3:3:0)

Hansen, Metten  
The history of the theater: from primitive, Egyptian, Greek, Roman, Medieval, and Elizabethan periods, to LDS theater history.

**565. Theater History 2.** (3:3:0)

Hansen, Metten  
The history of the theater: Oriental; Renaissance—Italy and France; Romanticism and the well-made play; birth and development of realism; departure from realism.

**572R. Child Drama 2.** (2:3:0 ea.)

Oaks  
The study of theory and techniques of formal drama for and with children.

**578R. Playwriting 2.** (2:2:0 ea.)

Golightly, Whitman  
Theories and techniques of conceiving and expressing experience as dramatic literature.

**590. Selected Readings and Projects.** (1-2:0:0)

Clinger  
Independent research and study outside of usual thesis work.

**600. Speech Communication as a Profession.** (3:3:0)

Bateman, Peterson, Stephan  
A study of the literature and the profession of speech communication.

**601. Psychology of Speech Communication.** (2:2:0) Pre-requisite: Sp. and Dram. Arts 101, 401, or 403.

Gibb, Peterson, Stephan  
Advanced study of the psychological elements in speech, language, and communication behavior.

**614. Organizational Communication.** (2:2:0)

Peterson  
Theory and research on questions of intraorganizational communication problems.

**621. Rhetorical Theory.** (3:3:0)

Stephan  
History and development of rhetorical principles in the classical world, with reference to the works of Socrates, Plato, Aristotle, Cicero, Quintilian, and others. Analysis of selected speeches from the periods.

**624. Contemporary and American Public Address.** (3:3:0)

Bateman, Clinger  
Historical and critical study of significant speeches and their relationship to American political, social, and intellectual life, with emphasis on contemporary modes of communication.

**625. Small-Group and Dyadic Communication.** (2:2:0)

Gibb, Peterson  
Theory of dyadic and small-group communication.

**626. Argumentation and Advocacy.** (2:2:0)

Bateman, Stephan  
Principles of argumentation applied to inquiry into and advocacy of social issues.

**660R. Seminar in Interpretation.** (3:3:0 ea.) Prerequisites: Sp. and Dram. Arts 121, 123, 325, or equivalent.

Gledhill  
Three subject matter areas are offered in rotation: 1. Interpretation of history and theory; interpretation of classical literature. 2. Program building; lecture recitals. 3. Research-analysis of interpretation techniques and performance, including interpretative theater.

**664. Theater Administration 1.** (2:2:0)

Henson, Oaks  
Study of theater-management theory and practice, including budget, promotion, box office, etc.

**665. Theater Administration 2.** (2:2:0)

Henson, Oaks  
Study of theater-administration theory and practice, including organizational philosophy, structure, development, etc.

**668R. Special Studies in Theater History.** (1-3:1-3:0 ea.)

Supervised research in selected historical problems.

**670. Technical Theater 3.** (5:5:3) Prerequisite: Sp. and

Dram. Arts 320, or consent of instructor. Henson, Pope

Advanced theories and practices of scenic design, construction, lighting, special and technical management for the theater.

**671. Directing 3.** (3:2:2) Prerequisites: Sp. and Dram. Arts 460, 461R or equivalent.

Hansen, Metten  
An advanced study of theories and techniques of directing for the stage through the production of two condensed scripts for presentation.

**674R. Projects in Theater.** (1-4:1-4:0 ea.)

Supervised applied theory in playwriting, directing, acting, and stagecraft.

**678. Stage Lighting.** (1-2:1-2:0) Prerequisite: Sp. and

Dram. Arts 320, or consent of instructor. Johnston, Pope  
Advanced theory and techniques of theatrical lighting.

**690. Methods and Problems of Research in Speech or Dramatic Arts.** (2-3:2-3:0)

Gibb, Pope  
Research, design, analysis, and strategies in speech communication. Required of all graduate students. It is imperative that graduate students take this course during their first semester.

**691R. Internship in Speech Communication.** (1-5:1-5:0 ea.) Prerequisites: Sp. and Dram. Arts 600, 690.

Bateman  
Limited to five hours total credit.

**693. Theory of Persuasion.** (2:2:0)

Gibb, Peterson, Stephan  
A study and application of ancient and modern persuasive concepts in forming, controlling, and/or changing opinions of individuals or groups.

**697R. Seminar in Special Theater Forms.** (2-3:2:1 ea.)

Theory and practice of editing, directing, and dramatizing for special theater forms (i.e., readers' theater, arena theater, etc.).

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.)**731. Dramatic Theory and Criticism 1.** (5:5:0)

Metten  
An intensive survey of the history and principles of dramatic theory and criticism from ancient to contemporary times.

**733. Dramatic Theory and Criticism 2.** (3:3:0)

Hansen  
A study and analysis of the major dramatic forms: tragedy, comedy, melodrama, and farce, combined with the theory of directing nonconventional dramatic literature.

**740. Seminar in the Theory and History of Theatrical Costuming.** (2:2:1)**760. Directing 4.** (2:2:0) Prerequisites: Sp. and Dram. Arts 564, 565, 671.

Hansen, Metten, Woodbury  
Theory and techniques of directing and staging historical and period plays: Greek, Roman, Medieval, Elizabethan, Restoration, and Continental plays.

**761. Directing 5.** (2:2:0) Prerequisites: Sp. and Dram. Arts 564, 565, 671, 733.

Hansen, Metten, Woodbury  
Theory and techniques of directing and staging plays from the modern and abstract repertoire: Expressionism, Constructivism, Epic, Absurd, Oriental, Cruelty, Happenings.

**797R. Research.** (1-6:Arr.:Arr. ea.)**799. Dissertation for Ph.D. Degree.** (Arr.)

## Statistics

**Professors.** Carter, Faulkner, Hilton (chairman, 206 TMCB), Nielson, Richards.

**Associate Professors.** Beus (graduate coordinator, 244 TMCB), Crandall, Hendrix, Rencher.

**Program.** Master of Science (M.S.).

**Entrance Examinations Required.** None.

**Application Consideration Dates.** Fall Semester, June 30; Winter Semester, November 15; Spring or Summer terms, March 10. If application is also made for financial assistance, all forms should be received three months prior to each of the above deadlines.

**Entry Times.** Fall Semester recommended, or Spring Term if Stat. 501 (or equivalent) has not been completed.

## Master of Science

**Prerequisites.** Stat. 501, Math. 315, and Comput. Sci. 131 or their equivalents.

**Fields.** Applied or theoretical statistics.

**Minors Permissible.** Option I or II.

**Requirements.** Minimum of 24 semester hours plus thesis (6-hr. min.—699). Each student must pass a written examination over the material covered in Stat. 501, part of 502, 520, and 521, before beginning his thesis research.

**Required Courses.** Stat. 636; two hours of Stat. 591R; one course from Stat. 611, 621, 631, 632, 690R; all of the following courses unless taken as an undergraduate: Stat. 520, 521, 522, 531 (or 534). Foreign students may be required to take ESL 101 or 102, depending on the outcome of an interview with the department after their arrival at Brigham Young University.

This program is designed to prepare students for (1) work in industry or government or (2) Ph.D. work in statistics.

## Minor Programs

**Master's Level.** 9 hours in any statistics course numbered 300 and above (except 552).

**Ph.D. Level.** Stat. 520 and 521, plus 9 additional hours from statistics courses numbered 433 and above (except 501, 552, and 554).

## Courses

**501. Statistics for Research Workers 1.** (5:4:3) Prerequisite: Math. 105 or equivalent. Beus, Carter, Hilton  
Probability; estimation; tests of hypotheses; regression; analysis of variance; nonparametric methods. For natural or social science students.

**502. Statistics for Research Workers 2.** (5:4:3) Prerequisite: Stat. 501 or equivalent. Beus, Carter, Hilton  
Analysis of covariance; multiple regression; linear models; design of experiments; sampling. For natural or social science students.

**520, 521. Theory of Statistics 1, 2.** (3:3:0 ea.) Prerequisite: Math. 214 or equivalent.

Development of the theory of discrete and continuous distribution functions, including derived sampling distributions; tests of hypotheses and point and interval estimation.

**522. Theory of Linear Models.** (4:4:0) Prerequisite: Stat. 521. Nielson, Rencher, Richards  
Linear hypotheses, with application to regression and design.

**531. Experimental Design.** (3:3:0) Prerequisite: Stat. 337 or 501. Carter, Hilton  
Randomized blocks, Latin squares, factorial designs, fractional replication, confounding, and incomplete blocks.

**534. Sampling.** (3:3:0) Prerequisite: Stat. 337 or equivalent. Crandall, Nielson  
Systematic, simple random, stratified, and cluster sampling; optimum allocation; ratio estimation; etc. Applications to various fields.

**536. Regression Analysis.** (3:3:0) Prerequisite: Stat. 337 or 501. Carter, Rencher

Multiple regression; introduction to model building and nonlinear estimation; examination of residuals; stepwise regression; Hocking-Leslie algorithm.

**541. Advanced Probability.** (3:3:0) Prerequisite: Math. 214. Recommended: completion of or concurrent registration in Stat. 520. Faulkner, Rencher

Advanced combinatorial methods; random walk; introduction to Markov chains and stochastic processes.

**552. Statistical Methods in Education 1.** (3:3:0) Prerequisite: consent of instructor. Beus, Hendrix  
Measures of central tendency, variability; correlations; introduction to probability and statistical inference. Computer usage stressed. For majors in education and related fields.

**554. Statistical Methods in Education 2.** (3:3:0) Prerequisite: Stat. 552. Hendrix  
Educational computer applications of analysis of variance and covariance, multiple and partial regression and correlation, and nonparametric methods. Introduction to experimental design.

**591R. Graduate Seminar in Statistics.** (1:1:0 ea.)

**611. Multivariate Statistical Methods.** (3:3:0) Prerequisite: Stat. 337 or 501. Rencher  
Inference about mean vectors and covariance matrices; multivariate analysis of variance and regression; canonical correlation; discriminant analysis; principal component analysis; factor analysis.

**621. Advanced Theory of Statistics.** (3:3:0) Prerequisites: Math. 315; Stat. 521. Recommended: Stat. 522. Faulkner, Nielson, Rencher  
Advanced topics in the theory of estimation, testing hypotheses, multiple regression, and multivariate analysis.

**631. Advanced Experimental Design.** (3:3:0) Prerequisites: Stat. 521, 531. Recommended: Stat. 522. Carter, Nielson  
Advanced topics in experimental design. Offered 1975 and alternate years.

**632. Advanced Industrial Statistics and Reliability.** (3:3:0) Prerequisites: Stat. 432, 521, or equivalent.  
Advanced topics in sequential sampling, tolerance limits, life testing, and reliability.

**636. Advanced Statistical Methods.** (3:3:0) Prerequisites: Stat. 337 (or 501), 521. Carter, Richards  
Analysis of variance with unequal subclass frequencies, including missing cells; analysis of covariance; orthogonal polynomials; multiple comparisons and related topics.

**690R. Special Topics in Statistics.** (3:3:0 ea.) Prerequisite: consent of instructor.  
Specialized topics in statistics varied from time to time.

**695. Readings in Statistics.** (1-3:1-3:0) Prerequisite: consent of department.

**699. Thesis for Master's Degree.** (6-9:Arr.:Arr.) Prerequisite: consent of department.

## Zoology

**Professors.** Allen, Allred, Andersen, Chapman, Frost, C. L. Hayward (emeritus), Heninger, Jaussi, Jorgensen (chairman, 575-A WIDB), Murphy, Nicholes, V. Tanner (emeritus), W. Tanner, Tipton, Wood.

**Associate Professors.** Barnes, Booth, Braithwaite, Heckmann, Miller, Smith (graduate coordinator, 163 WIDB), C. M. White.

**Assistant Professors.** Bradshaw, Farmer, G. L. Hayward, Jeffery, Rhees, Seegmiller, Whitehead.



**Programs.** Master of Science (M.S.), Doctor of Philosophy (Ph.D.).

**Entrance Examinations Required.** Graduate Record Examination prior to consideration for admission and a departmental written examination during the first semester of resident study.

**Application Consideration Dates.** Prior to March 1 for Fall Semester and October 1 for Winter Semester.

**Entry Times.** Fall or Winter semesters.

## Master of Science

**Prerequisite.** B.S. degree in zoology from an accredited college or university, or the equivalent.

**Fields.** Biological science education, entomology, genetics, zoology.

**Minors Permissible.** Any established minor in the biological or physical sciences; Option II.

**Requirements.** Minimum of 30 semester hours including thesis (6-hr. min.—699). (Consult graduate coordinator for modified requirements in biological science education.)

**Required Courses.** Zool. 521; 696R during two semesters of resident study.

## Doctor of Philosophy

**Prerequisites.** Master's degree in zoology or the equivalent. Option II for the two-language requirement or its equivalent may be met by completing 9 credit hours in computer science courses (131 and above), in mathematics (112 and above), in statistics (502 and above), or with a combination of 9 credit hours from these fields.

**Fields.** Entomology, genetics, zoology.

**Minors Permissible.** Any established minor in the biological or physical sciences.

**Requirements.** Minimum of 24 semester hours plus dissertation (18-hr. min.—799), plus one semester of off-campus study recommended unless M.S. is completed elsewhere.

**Required Courses.** Zool. 521; 696R during two semesters of resident study.

## Courses

☐ **Statistics 501. Statistics for Research Workers I.** (5:4:3)

☐ **Microbiology 511. Immunology.** (4:2:6)

**517. Experimental Parasitology.** (3:2:3) Prerequisite: Zool. 317 or 417. Andersen, Heckmann  
Offered 1975-76 and alternate years.

**521. Zoological Literature.** (2:2:0) Wood  
Literature research techniques necessary for zoological research.

☐ **Botany 522. Biological Instrumentation.** (3:1:6)

**526. (Bot.-Zool.) Cell Biology.** (4:3:3) Prerequisite: Introductory course in biochemistry.  
Molecular physiology and ultrastructure of cells and tissues, with emphasis on eucaryotic organisms.

**530. Insect Classification.** (4:1:6) Prerequisite: Zool. 331. Wood

**531. Insect Physiology.** (4:2:6) Prerequisites: Zool. 331; Chem. 252 or 351. Whitehead

**532. Insect Morphology.** (3:2:3) Prerequisite: Zool. 331. Whitehead

**534. Economic Entomology.** (3:2:2) Prerequisite: Zool. 331. Jorgensen

Offered 1976-77 and alternate years.

**535. Medical Entomology.** (3:2:2) Prerequisite: Zool. 331. Recommended: Micro. 331. Tipton  
Arthropods and arachnids which affect the health of man and domestic animals.

**536. Comparative Toxicology.** (3:2:3) Prerequisites: general biology and a course in organic chemistry. Booth  
Modes of action and biological transformations of pesticides in living animals, plants and the environment. Techniques emphasized.

**538. Immature Insects.** (2:0:4) Wood  
Offered 1975-76 and alternate years.

**543. Ichthyology.** (2:2:2) Prerequisite: Zool. 203.

**545. Herpetology.** (2:1:2) Prerequisite: Zool. 203. W. Tanner

**546. Ornithology.** (2:1:2) Prerequisite: Zool. 203. Frost

**547. Mammalogy.** (2:2:2) Prerequisite: Zool. 203. Smith

**549R. Advanced Topics in Zoology.** (1-4:Arr.:Arr. ea.) Prerequisite: consent of instructor.

**551. Population Ecology.** (3:2:3) Prerequisites: Zool. 350; concurrent registration in or completion of Stat. 501. Jorgensen  
Offered 1976-77 and alternate years.

**552. (Bot.-Zool.) Terrestrial Ecosystems.** (4:3:Arr.) Prerequisites: Zool. 350; Stat. 221 or 501.

Biotic communities of the earth; population dynamics; reproductive, life-form, and longevity patterns; species interactions; and structure, dynamics, and evolution of communities. Extended field trips.

**556. Limnology.** (3:2:2) Prerequisite: Zool. 350 or equivalent.  
Field trips scheduled four Saturdays.

**565. Endocrinology.** (3:3:0) Prerequisite: Zool. 461. Heninger, Jaussi

**566. Experimental Endocrinology.** (2:0:6) Prerequisite: completion of or concurrent registration in Zool. 565. Heninger, Jaussi

Experiments selected to familiarize students with techniques used in research.

**575. Biochemical Genetics.** (3:3:0) Prerequisites: Chem. 481, Zool. 371, or equivalent. Farmer  
Emphasis on eucaryotic organisms. Offered 1976-77 and alternate years.

**576. Human Genetics.** (3:3:0) Prerequisite: Zool. 371. Offered 1976-77 and alternate years.

**577. Developmental Genetics.** (3:3:0) Prerequisites: Zool. 371, 483. Bradshaw, Jeffery  
Control of gene expression during embryonic development; genetic mechanisms of cell differentiation.

☐ **Geology 580 or 581. Invertebrate Paleontology.** (4:3:2)

**582R. Advanced Topics in Developmental Biology.** (2:2:0 ea.) Prerequisite: Zool. 483.

**583. Etiology and Pathology of Brain Injury.** (3:3:0) Prerequisite: consent of instructor. Chapman  
May not be used for credit toward a major in zoology.

**584. Neurology.** (3:2:2) Prerequisite: consent of instructor. Chapman

☐ **Geology 584. Vertebrate Paleontology.** (4:3:2)

**591R. Special Problems in Zoology.** (1-2:Arr.:Arr. ea.) Prerequisite: consent of instructor.

**601. Zoogeography. (2:2:0)**

Offered 1976-77 and alternate years

C. White

**609. Systematic Zoology. (2:1:2)**

Offered 1976-77 and alternate years.

Wood

☐ **Microbiology 611. Advanced Immunology. (2:2:0)****612. Advanced Invertebrate Zoology 1. (3:2:3)**

Prerequisite: Zool. 202 or consent of instructor. Braithwaite

Comprehensive biology of the lower Metazoa (Parazoa, Radiata, Acoelomata, Pseudocoelomata, and lower Protozomia). Offered 1976-77 and alternate years.

**613. Advanced Invertebrate Zoology 2. (3:2:3)**

Prerequisite: Zool. 612 or consent of instructor. Barnes, Braithwaite

Comprehensive biology of the higher Protostomia and Deuterostomia, excluding the terrestrial arthropods. Offered 1976-77 and alternate years.

**620. Theoretical Zoology. (2:2:0)**

Prerequisite: consent of instructor. Tanner

☐ **Botany 621. Electron Microscopy. (2:2:0)**☐ **Botany 622. Electron Microscopy Laboratory. (1:0:3)**☐ **Microbiology 632. Cell and Tissue Culture Techniques. (2:0:4)****633R. Advanced Topics in Entomology. (1-2:Arr.:Arr. ea.)**

Prerequisite: consent of instructor.

☐ **Botany 638. Genetics of the Fungi. (2:2:0)**☐ **Microbiology 641. Radioactive Tracer Techniques in Biology. (3:1:6)****657R. Advanced Topics in Animal Ecology. (2:2:0 ea.)**

Prerequisite: Zool. 350.

The specific topic will be announced at the beginning of each semester.

☐ **Microbiology 661. Microbial Genetics. (4:2:6)****662. Advanced Physiology 1. (2:1:2)**

Prerequisite: Zool. 461 or consent of instructor. Jaussi, Heninger

**663. Advanced Physiology 2. (2:1:3)**

Prerequisite: Zool. 461 or consent of instructor. Jaussi, Heninger

☐ **Botany 676. Cytogenetics. (3:2:3)**☐ **Botany 678. Organic Evolution. (3:3:0)**☐ **Geology 680. Micropaleontology. (3:2:2)**☐ **Geology 685. Paleoeology. (4:3:2)****696R. Graduate Seminar. (½:1:0 ea.)****699. Thesis for Master's Degree. (Arr.)****799. Dissertation for Ph.D. Degree. (Arr.)**

Brigham Young Academy campus as it appeared in 1902.





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